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Osseous Injuries in the Newborn

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Masterful neglect as a form of treatment is not often justified in modern medical practice. However, it may be legitimate therapy in certain osseous injuries occurring in newborns. The newborn has such tremendous power to form callus and heal bone that nonunion of fractures is almost unknown. Extensive angulation and shortening usually are corrected by subsequent growth. The authors outline the management of osseous injuries for which treatment is indicated.

TRAUMA to the skeleton of the newborn infant is of interest to the family physician, obstetrician, pediatrician and orthopedist. The diagnosis is rarely difficult if the examiner is thorough and understands the skeletal development in the newborn. He also should appreciate the manner in which the periosteum and soft tissues may react to trauma. With proper diagnosis and adequate treatment, the results are excellent in a majority of cases. The newborn infant has a propensity for the formation of callus and healing of fractures. Subsequent growth usually restores angulation deformities.

Since the time factor may be extremely important in breech deliveries, the obstetrician may deliberately fracture the clavicle or humerus in difficult deliveries. The clavicle also may be deliberately fractured in shoulder dystocia encountered in infants of excessive size. It is obviously better to incur osseous injury than to risk serious anoxia with impaired cerebral function or even loss of the baby.

Watson-Jones[1] presented a classification that includes the following: fracture or epiphysial displacement from injury sustained in a difficult delivery, multiple fractures associated with congenital fragility, and fractures of the tibia associated with congenital pseudarthrosis. To this list we would add "traumatic ossifying periostitis," or "periosteal stripping," as described by Snedecor and Wilson.[2] Fragilitas ossium, congenital pseudarthrosis, and congenital dislocation of the knee and hip will not be considered. They present totally different problems in etiology and management.

One should be familiar with the normal variations in the newborn before any angular or rotational deformity is ascribed to trauma. Blount[3] noted that the newborn baby has flexed knees and hips. The knees are rotated externally while the feet are rotated inwardly, and lateral bowing of the femur and tibia is evident. These physiologic "deformities" normally are corrected in the first two years of life.

Obstetric palsy should be mentioned, since it may be due to a nerve injury from trauma about the shoulder joint and may present a confusing clinical picture. Also, injury to both bone and the brachial plexus may occur. In obstetric palsy, flaccid paralysis of the upper extremity is present, and the shoulder is internally rotated and abducted. The elbow is usually flexed, and the wrist is flexed and pronated. Duchienne, in 1861, as noted by Speed and Knight,[4] stated that posterior dislocation of the shoulder occurs in some of these infants and that lateral displacement and retroversion of the epiphysis are the usual finding. Blount[3] mentioned that a nerve lesion may be accompanied by dislocation of the shoulder that is spontaneously reduced before examination; one should avoid abduction in a splint if this condition is suspected to be present. Roentgenograms will help rule out dislocation and injury to bone and should be taken in all cases of birth palsy.

Dr. Mitchell is a Fellow in Orthopedic Surgery, Mayo Foundation, and Dr. Coventry is from the Section of Orthopedic Surgery, Mayo Clinic and Mayo Foundation, Rochester, Minnesota. The Mayo Foundation is a part of the Graduate School of the University of Minnesota.

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Fractures of the Long Bones

Authors disagree as to the usual order of frequency of fractures of long bones. Watson-Jones reported that fractures of the shaft of the humerus

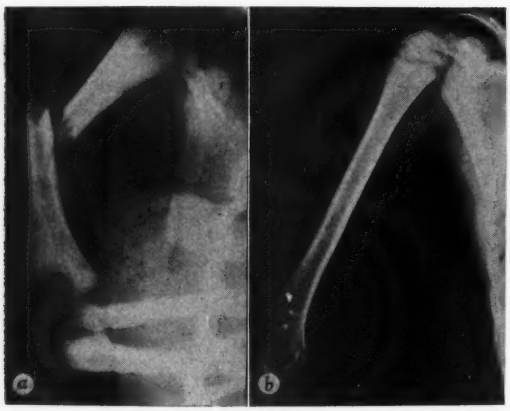


Fig. 1. Fracture of right humerus. *(a)* Appearance immediately after birth. *(b)* Appearance five and one-half years after treatment. A Velpeau swathe was used and no attempt at correction of position was made.

are most frequent. Madsen[5] and Snedecor and Wilson mentioned that fracture of one or both clavicles is noted most often. Following these, fracture of the shaft of the femur and displacement of the epiphysis of the humerus or the femur occur in that order. Depressed fracture of the skull is noted occasionally but is not ordinarily of serious significance and will not be discussed.

Madsen, in 1955, reported an analysis of 786 fractures among 105,119 newborns. Fracture of the clavicle was the most common, numbering 726 instances; forty-one fractures of the humeral shaft and twenty-five fractures of the femur were found. Follow-up studies in twenty-six cases of the shaft fractures demonstrated radiologic evidence of the fracture even after thirty years. Harris and Steinberg,[6] in a study of abnormalities observed during the first six days of life in 8,716 live-born infants, noted sixteen fractures; fourteen involved the clavicle, one the femoral shaft and one the parietal region of the skull.

Fractures of the shaft are usually complete and may have considerable displacement. The first evidence of injury may be the tumor formed by the callus two to three weeks after delivery. Callus may be seen roentgenographically as early as the fifth day, and it is usually decreasing by the eighteenth day. By the end of three months, the bone usually is normally healed. Nonunion is seen rarely, and remodeling in the first few years of life will restore angulation deformities. About one fourth of the fractures of long bones occur in infants with cephalic presentation; the remainder are seen in breech deliveries. The mother is usually primiparous, and most of the infants are not exceptionally large at birth.

Fracture of the Shaft of the Humerus.—These usually occur in the middle third of the humerus and are transverse or spiral (Fig. 1). They frequently display anterolateral angulation. They may occur during breech delivery, the mechanism being traction on the extended arms. The mechanism in vertex presentations is usually axillary traction as the impacted shoulder is delivered. The proximal fragment is often abducted by the pull of the deltoid muscle. Palsy of the radial nerve frequently is noted but spontaneous recovery usually takes place.

Treatment should not be strenuous. The bone will heal and correct any angulation in time. The arm may be strapped to the thorax over a pad thick enough to cause moderate abduction, or the arm may be abducted with sandbags for about a week. At the end of this time, the fracture is usually "sticky" and pain is minimal.

The prognosis is usually excellent whatever treatment is chosen. Perfect remodeling may be noted even with 40 to 50 degrees of outward angulation. Shortening and angulation are usually relieved in the first two years.

Fractures of the Clavicle.—These fractures are usually in the midshaft of the bone and frequently are caused by digital pressure in delivering the aftercoming head and sometimes in the rotation of shoulders or by compression in shoulder dystocia of large babies. Callus appearing in two to three weeks may be the first indication of injury, or the infant may not move the extremity normally. Treatment is unnecessary.

Fractures of the Shaft of the Femur.—These fractures are usually transverse and in the middle third of the bone. The mechanism is said to be torsion of the presenting leg in breech deliveries or internal podalic version. The psoas muscle causes the proximal fragment to be strongly flexed and at a right angle to the distal fragment, thereby displacing the bone fragments.

Fractures of the femoral shaft require treatment. If the limb is extended in a Thomas splint

or a plaster cast, the fragments will unite with considerable forward angulation. If the limb is bandaged to the infant's body with the hip fully flexed, shortening will not be corrected.

Bryant's traction appears to be the most rational form of treatment. The limb is held at a right angle to the trunk, in the same axis that the proximal fragment is held by the psoas muscle. In this manner, alignment is maintained. Length is preserved by traction. It is practical treatment from a nursing standpoint. An efficient restraint is necessary across the trunk, and it is better to use separate weights and pulleys for each limb. As much as 1 cm. of overriding is acceptable, as is 20 degrees of posterior angulation. Extreme care must be exercised to guard against circulatory embarrassment from the cutaneous traction and bandages. Pain, pallor or cyanosis, and swelling of the feet are signs of danger. Union of fractures of the femoral shaft may occur in two weeks, but traction should be maintained until the callus is no longer tender, which usually is about three weeks from the time of fracture.

Periosteal Stripping and Epiphysial Displacement

Periosteal stripping may result from the trauma of a difficult delivery, such as a breech presentation in a primiparous mother. On the day following delivery, the extremities may be tender and swollen, and passive motion may produce pain. Roentgenograms are usually normal at this time; however, if others are taken in five to seven days, dense shadows of calcification are seen about the epiphyses, or subperiosteally, if the muscles and periosteum have pulled away from the bone (Fig. 2). Even complete separation of the epiphysis may occur. The proliferative calcification may be expected to resorb in three to five months. Specific treatment is not indicated and the prognosis is good.

Snedecor and Wilson, in 1949, reported their observations on fifty consecutive infants delivered from breech presentations. Roentgenograms were made on the seventh postnatal day. There was evidence of subperiosteal or epiphysial hemorrhage in 6 per cent of these infants, and an equal number had soft-tissue injuries. Since the epiphyses are the weakest point of the long bones, these authors considered that traumatic deliveries often caused subperiosteal stripping of adjacent tissues. Proliferative calcification takes place in the hemorrhagic zone in five to ten days and becomes evident on the roentgenogram.

Epiphysial displacements usually are noted in the lower part of the femur or in the upper or lower part of the humerus. The trauma incident to breech extraction is usually responsible for epiphysial separation. The obstetrician may hear or feel the shaft of a bone "crack" but may be unaware of an epiphysial injury. The soft tissues are often tense and swollen and may be reddened. Pain frequently abates by the time roentgenologic evidence of injury appears. If displacement is absent or minimal, treatment is not needed. In the occasional infant with displacement of the epiphysis, gentle manipulation and splinting are the best treatment.

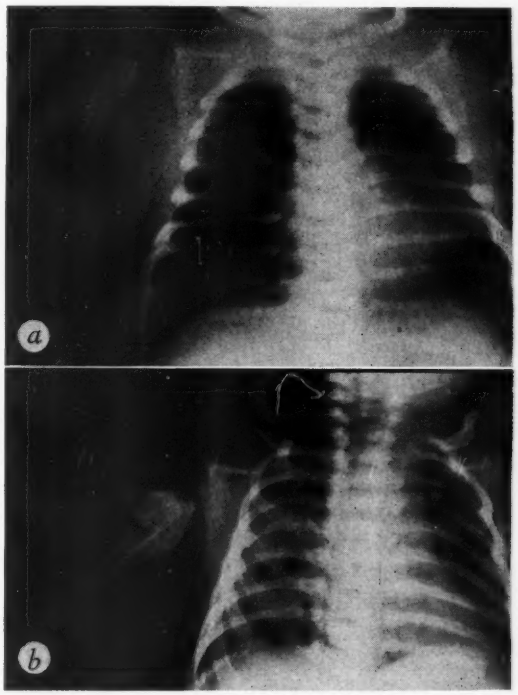


Fig. 2. *(a)* Appearance immediately after birth. *(b)* One month later, the same region shows subperiosteal and epiphysial calcification.

Lower Femoral Epiphysis.—Displacement is obvious in the roentgenogram, since this epiphysis is present at birth. The periosteum is stripped and displaced backward with the epiphysis. If not corrected, the hematoma may ossify, forming a new shaft. Even with this deformity, the roentgenogram may appear normal after two or three years. The infant should be placed in a Bryant

traction frame for two or three weeks. Traction is important before the knee is extended in order to prevent damage to the popliteal vessels.

Upper Femoral Epiphysis.—Traumatic separation of the upper femoral epiphysis as a birth injury is rare. Baron and associates,[7] in 1951, stated that twenty cases had been reported up to 1944, all in conjunction with breech presentation. Forceful manipulation of the infant's leg is the usual cause. Kennedy[8] suggested that the infant should be examined more carefully in difficult and traumatic deliveries; if version and extraction are done, serial roentgenograms should be obtained for at least three weeks after birth. Slight shortening, limited active and painful passive motion, external-rotation deformity of the extremities and, occasionally, discoloration of the thigh are evident. Roentgenologic examination is essential for diagnosis. Proximal displacement of the diaphysis, formation of callus, subperiosteal reaction, premature ossification of the capital epiphysis and accelerated growth of the neck may be seen on the roentgenograms. Baron and co-workers determined that the most stable position for the epiphysis was flexion of the thigh to 90 degrees and abduction to 40 degrees. This was determined on the basis of studies on cadavers. They recommend use of a spica cast for six weeks. Bryant's traction may be used as well. Coxa vara and degenerative changes may be late sequelae.

Lower Humeral Epiphysis.—The center of ossification of the lower humeral epiphysis does not appear until the latter half of the first year. Roentgenograms are not diagnostic until ten to fourteen days after injury, at which time evidence of ossification in the reactive callus becomes visible. The clinical diagnosis is based on pain, swelling and immobility of the extremity. Treatment is best effected by traction, followed by 90 degrees of elbow flexion, the forearm being placed in a sling. Even with imperfect reduction, the regenerative process usually results in full anatomic correction.

Upper Humeral Epiphysis.—The probable cause of this injury is strong traction during breech delivery. Shulman and Terhune[9] reported that this is more frequent than is injury to the lower humeral epiphysis. Fracture of the clavicle, or shaft of the humerus, and obstetric palsy must be differentiated by physical examination and roentgenograms. The examiner may be presented with the situation of injury to both bone and the brachial plexus, as already mentioned.

Treatment of separation of the upper humeral epiphysis requires only immobilization and rest. Brief lateral traction with the side of the crib elevated is sometimes helpful, but use of a collar and cuff is usually sufficient.

Summary and Conclusions

Injury to the bones and epiphyses of the newborn is of interest and importance to a wide segment of the medical profession.

Primiparous mothers with difficult breech deliveries constitute the largest group with which such injuries are associated. Torsion, traction and digital pressure are the usual mechanisms of injury. The fracture may be induced deliberately to facilitate delivery of the baby.

The newborn has such unique propensity for the formation of callus and healing of bones that nonunion is almost unknown. Shortening, and angulation of even 40 to 50 degrees usually are corrected by subsequent growth.

Fractures of the femoral shaft require active treatment. Bryant's traction gives excellent results if used properly.

Traumatic deliveries may cause epiphysial or subperiosteal hemorrhage presenting clinical symptoms; however, roentgenographic evidence of injury may not be present until proliferative calcification occurs in the hematoma, which may take five to seven days. Such injuries apparently all heal without residual deformity.

References

1. Watson-Jones, Reginald: Fractures and Joint Injuries. Ed. 4, vol. 1, pp. 351-360. Baltimore: Williams & Wilkins Company, 1955.
2. Snedecor, S. T., and Wilson, H. B.: Some obstetrical injuries to long bones. J. Bone & Joint Surg., 31-A:378-384 (Apr.) 1949.
3. Blount, W. P.: Fractures in Children. 279 pp. Baltimore: Williams & Wilkins Company, 1954.
4. Speed, J. S., and Knight, R. A.: Campbell's Operative Orthopaedics. Ed. 3, vol. 2, pp. 1915-1918. St. Louis: C. V. Mosby Company, 1956.
5. Madsen, E. T.: Fractures of extremities in newborn. Acta. obst. et gynec. scandinav., 34:41-74, 1955.
6. Harris, L. E., and Steinberg, A. G.: Abnormalities observed during first six days of life in 8,716 liveborn infants. Pediatrics, 14:314-326 (Oct.) 1954.
7. Baron, G. J., Egel, N., and Zuck, F. N.: Birth trauma to proximal femur. New York J. Med., 51:2859-2864 (Dec. 15) 1951.
8. Kennedy, P. C.: Traumatic separation of the upper femoral epiphysis: A birth injury. Am. J. Roentgenol., 51:707-719 (June) 1944.
9. Shulman, B. H., and Terhune, C. B.: Epiphyseal injuries in breech delivery. Pediatrics, 8:693-700 (Nov.) 1951.

Review of Twenty Years of Colon Surgery

With an Analysis of Colon Anastomosis by the Murphy Button Technique

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Minneapolis, Minnesota

BEFORE the days of our present knowledge of antibiotics, judicious use of blood transfusions, and modern anesthesia, primary resection of the colon was a hazardous undertaking and carried a high mortality. Mummery,[1] in 1923, collected eighty-six cases with primary anastomosis resulting in a mortality of 37 per cent, which was about the mortality range at that time in the hands of the best surgeons.

Various extra-peritoneal operations were therefore devised and came into common use. For example, for carcinomas of the rectum the Kraski two-stage operation was the one usually used; in the colon, itself, some type of exteriosation operation was done—mostly the so-called Paul or Mikulicz procedure in which the lesion and bowel were brought out of the abdomen and the lesion was at once or later resected and the anastomosis performed at a later stage. This proved on the whole to be very satisfactory but, of course, involved several stages and caused considerable disability of the patient for a long time, and an adequate dissection could not be done.

A review of lesions of the colon operated upon during the past twenty years (1936 through 1956) has been made. During this period, the author operated upon 189 cases. Forty cases were not operable and only palliative operations were done, such as short circuit to relieve obstruction, permanent colostomy with or without cautery, or cautery alone if it was carcinoma of the rectum.[2,3] In the remainder, various techniques were used, such as those recently described. The two-stage Mikulicz was used in the colon and the abdominoperineal resection for low sigmoid and rectum was used in most instances, while in only ten, the Kraski operation was done.

The etiology of carcinoma of the colon is no more clearly understood than is that of carcinoma of other parts of the body. However, we have certain contributing factors—especially the situation where polyps are present. It has become increasingly certain that polyps in the colon will undergo malignant changes, and this is probably much more often the primary cause than is still generally understood.

There are four types of carcinomas of the colon:

1. The raised polypoid growth which grows into the lumen of the bowel and often gives rise to early symptoms, especially the passing of mucus and blood or signs of obstruction. As a rule these are among the less malignant, and because of their symptoms patients often seek early relief.

2. The ulcerating crater-like growth with a nodular margin. These penetrate deep into the surrounding structures, often are late in producing symptoms and relatively early in invading the lymphatics and the blood stream, and also tend to penetrate the bowel wall.

3. The annular constricting growths which con-

From the Nicollet Clinic, 1009 Nicollet Avenue, Minneapolis 3, Minnesota.
Presented before the Minnesota Academy of Medicine, April 10, 1957.

TABLE I. MURPHY BUTTON CASES

Cases of carcinoma		60
Cases not carcinoma		21
Diverticulitis of sigmoid	6	
Polypoid tumors of colon	8	
Granuloma of cecum	2	
Lipoma of descending colon	1	
Gastro-colic fistula	1	
Others	3	
Total	21	81

tain a large amount of fibrous tissue, and cause early constriction of the bowel. Occasionally acute intestinal obstruction is the first serious symptom.

4. The soft, gelatinous or coloid growths either single or multiple. These are not common but are rapidly growing and highly malignant.

The methods of spread are:

1. By direct penetration through the bowel wall and invading the surrounding structures or shedding of cells into the general peritoneal cavity so that numerous transplants take place later on.

2. Spread into the adjacent lymphatics. This is perhaps one of the most common and may also occur with any of the other known spreads.

3. Direct spread into blood vessels and therefore early wide dissemination of the growth. Madison, Dockerty, and Waugh[4] proved that by injecting the veins in specimens of carcinomas of the rectum with radio-opaque material, they could demonstrate the plugging of the veins and prove this by microscopic examination to be carcinoma. Grinnell[5] found venous invasion in 14 to 36 per cent of removed surgical specimens of the colon and rectum.

4. A spread directly along the bowel wall, the so-called intramural spread. Robert S. Grinnell[6] found that retrograde intramural spread was from 1 to 7 cm. in eight of the ninety-three carcinomas located 5 to 18 cm. from the dentate line. This is interesting because it becomes necessary to do a fairly wide resection particularly in rectal carcinomas.

The symptoms depend upon the location of the lesion. For example, carcinomas of the rectum and low sigmoid where about 70 per cent of carcinomas occur, the early symptoms are those of bleeding and passing of mucus. In the cecum and the right colon, the symptoms are not very evident over long periods of time. Early obstruction is very uncommon. The usual symptoms are those of anemia, gradual loss of weight, and these are often mistaken for ordinary cases of anemia. Elsewhere in the colon there may be symptoms of constipation, and this may lead to an early examination to make the proper diagnosis.

Diagnosis

Although we now have the proctosigmoidoscope and very good x-ray examinations, diagnosis comes too late in many cases. This is usually due to the patient who pays too little attention to the symptoms, or else is due to the physician who does not follow up his cases properly. It is well to do a routine proctosigmoidoscopic examination. It is easy to do and gives the best information in the rectum and lower sigmoid. There are other lesions, such as polyps, that can easily be eradicated through the proctoscope with subsequent microscopic study being made. X-ray examination alone is not very satisfactory in the lower bowel and therefore proctoscopic examination has to be depended upon. X-ray should be carried out with a good deal of care. It is well to do a contrast barium enema. If there are any suspicious symptoms, even though the x-ray may not show anything, such a patient should be rechecked at once and again within a month because it is very easy to overlook carcinomas, particularly in the sigmoid and cecum. A much neglected test for occult blood in the stool may prove valuable in many cases. This should be done as a routine procedure in all suspicious cases.

TABLE II. CARCINOMA LOCATION

	Operable	Palliative	Total
Lower sigmoid	23	4	27
Mid and upper sigmoid	4	1	5
Cecum and ascending colon	11	5	16
Transverse colon	8	3	11
Splenic flexure	1	0	1
Total	47	13	60

Treatment

Indeed a new era has developed in surgery of the colon since the discovery and judicious use of antibiotic drugs, blood transfusions and modern anesthesia. It is difficult to understand now the trouble that we used to have many years ago. The mortality now, because of this new era of treatment, has been reduced to a very low level in cases that are fair risks and do not have other combined lesions. Much has been done during the past ten years to improve the technique and to understand the use of physiologic chemistry in combatting depletions of these patients previous to and after the operation.

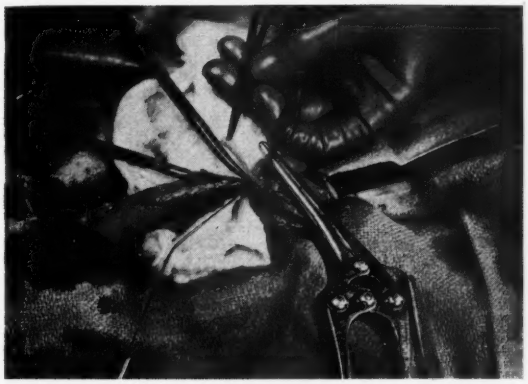


Fig. 1. The purse string silk suture has been placed in the proximal end and the crushed portion is being cut off.

Resection of colon by application of the Murphy button technique.—This is not new but it has not, we believe, been used to any extent in colon resection. During the years the author was associated with Dr. Murphy (1910-1915), we used the button mostly in gastroenterostomies and in the small bowel. I had never seen him use it in a colon resection.

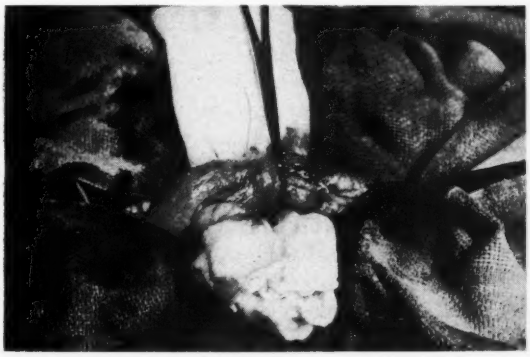


Fig. 3. The button has been closed so that there is a tight anastomosis of end of ileum to end of transverse colon—in a right colon resection.

I continued to use the Murphy button in various parts of the gastrointestinal tract; such as, the small bowel and the right colon, for many years. On May 12, 1937,[7] I read a paper before the Minnesota Academy of Medicine in which I described the application of the button in a resection of a carcinoma of the jejunum. Although I had used it off and on during the years, the first record I have of using it on the colon was in a case of resection of the right colon on a Mrs. G. H., December 11, 1940, with carcinoma of the cecum. Since then I have used it in all parts of the colon, especially in bad risk cases. Before bowel antibiotics it was very useful because if carefully done it essentially became a closed technique without soiling. I have now used it as an operative procedure in all parts of the colon in eighty-one cases. Sixty were carcinoma and twenty-one were non-malignant. Let it be clearly understood that this is only another method and it does not need to replace the suture method.

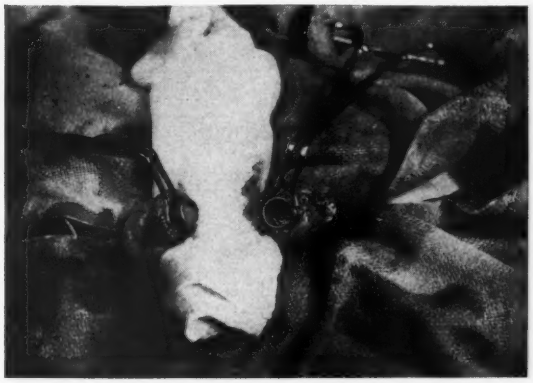


Fig. 2. The purse string suture has been tied and the button forceps applied.

However, the Murphy button technique has some advantages, we believe, in special cases. There is no leakage if the circulation is adequate.



Fig. 4. A continuous 4-0 intestinal chromic is being applied. This is to be followed by fine interrupted silk sutures.

The bowel lumen heals without a scar. There is no suture of the mucous membrane, and this obviates, in all probability, local recurrences of carcinoma in the suture line. Cole[8] observed in fifty-five consecutive cases with colon resection, 16 per cent local recurrence—two-thirds of these were at the suture line. The button technique can be

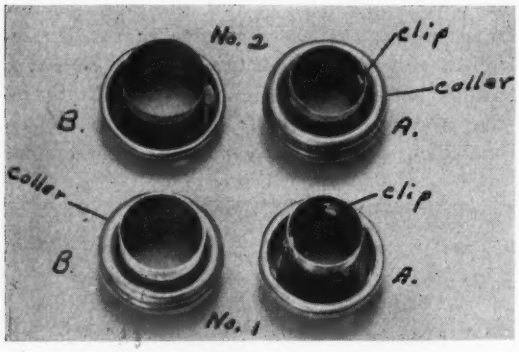


Fig. 5. Illustration of Button. No. 1 button is correct. The clips are on the male (a) part of the button and the collar and spring on the female (b) part. Therefore, the button closes firmly on both ends of the bowel. No. 2 button is incorrect. The collar and spring are on the male (a) part of the button and there is, therefore, no clearance to close the button.

To illustrate the technique, a cloth tube can be made to represent the bowel. The silk purse string is placed and the button tied into each end. The button is then engaged and closed. The cloth is not as thick as the bowel but it will show the technique and reveal the correct and incorrect button.

used in colon obstruction without preparation or a preliminary colostomy. It is easier to do in carcinomas low in the sigmoid, especially when the patient is quite obese.

Technique

General points in the technique: Tie off the colon above and below the lesion to prevent any cell spread along the lumen during the surgical procedure. Tie off the circulation at its source to prevent spread through the vessels. Perform a thorough removal of the glands into which the lesion drains, proceeding with the usual resection which is now standard for all colon surgery.

For the Murphy button technique: (1) Choose a button to fit the bowel, usually a 22 mm. button is used in the right colon, and a 24 mm. button in the sigmoid or end-to-end of the colon elsewhere. (2) After the bowel has been resected and the clamps are on the remaining ends, a No. 2-0 silk purse string suture is placed in the end of the bowel on both sides. (3) Trim off the crushed bowel that has been destroyed by the clamp. (4) Grasp the shaft of the button with a forceps and insert it into both ends. Tie it in and apply the button forceps to hold it in place. (5) The male part of the button should be in the proximal bowel. (6) Engage the button while removing the forceps. After the forceps have been removed, press the button firmly together. My button forceps have been made at an angle, as illustrated in Figure 2, so they can be used deep down in the pelvis or any other locality where a straight forceps would be cumbersome. (7) Reinforce the anastomosis with one row of continuous 4-0 intestinal chronic catgut and one row of interrupted fine silk.

TABLE III. CARCINOMA OF LOWER SIGMOID—RESULTS

Number of Patients	Living and Well	Survival
Operable—23	16	7 (8 to 11 yrs.) 5 (5 to 7 yrs.) 4 (2 to 4 yrs.)
		2 died other causes (6½ yrs. and 8½ yrs.)
Palliative—4		3 lived 4 to 18 months. 1 died following operation (cerebral thrombosis).

TABLE IV. CARCINOMA OF MID AND UPPER SIGMOID—RESULTS

Number of Patients	Living and Well	Survival
Operable—4	2	2 (8 yrs.) 1 died 6½ yrs. from melanoma 1 died 3 yrs. from metastasis
Palliative—1	1	18 months

The button usually releases itself about the tenth day. A few in the low sigmoid have passed on the fifth to eighth day. The longest has been twenty-three days. It often becomes loose in the bowel and passes into the rectal pouch where it can usually be felt by finger examination. In none of my cases has a button failed to pass.

A word of caution, however. Many of the buttons in the market today are incorrectly made. Figure 5 shows the correct and incorrect design. If the wrong button is used, it will not close tightly on the ends of the bowel.

Results

The cases considered operable were those in which the lesion and metastatic areas could be removed. The cases considered palliative were those in which metastatic lesions could not be removed because they were in the liver or widespread in the abdomen, and only resection of the lesion itself or a short circuit operation could be done to relieve or prevent obstruction.

All but one of the cases were followed. An eighty-year-old, senile woman who was taken to a rest home, could not be traced. The average age was sixty-nine; the youngest thirty-two and the

TABLE V. CARCINOMA OF CECUM AND ASCENDING COLON—RESULTS

Number of Patients	Living and Well	Survival
Operable—11	6	1 (12 yrs.) 4 (7 to 8 yrs.) 1 (3 yrs.) 1 died after 8 yrs.—abdominal metastasis 1 died, 6½ yrs., aged 90 of cerebral hemorrhage 1 died, 5 months, brain metastasis 1 died, 6 months, aged 99, senility 1 died, 5 days postoperative
Palliative—5		Lived 3 to 8 months.

oldest ninety-nine. Because many were advanced in age, they have died of other causes than carcinoma. Six have died of cerebral hemorrhage or cardiac failure. One died six-and-a-half years postoperatively of bleeding duodenal ulcer. One died eight-and-a-half years postoperatively of

TABLE VII. CARCINOMA OF THE SPLENIC FLEXURE—RESULTS

Number of Patients	Living and Well	Survival
1	1	1 (9½ yrs.)

adenoma of the pancreas at eighty-eight years of age. In both, postmortem examination showed no carcinoma. One died six-and-a-half years after carcinoma from melanoma. The number of cases presented here is small but the main object is to present this as a method of colon resection and to describe the technique.

It must be remembered that often the Murphy button technique was used in the extremely bad risk cases. There was mortality in four cases as follows:

Case 1.—Mr. S., aged seventy-four. Operated for carcinoma of the sigmoid with obstruction on October 7, 1947. Well until September 10, 1949. Admitted with carcinoma of the transverse colon and ileum. Both resected. Died twenty-four hours postoperatively from cerebral hemorrhage.

Case 2.—Mrs. W., aged sixty-five. Three years of symptoms. Operated for carcinoma of the sigmoid, October 4, 1948. Palliative operation for obstruction—died twenty-four hours postoperatively. Postmortem: Infarction at brain stem; atelectasis. Never rallied after operation.

Case 3.—Mr. H., aged seventy-one. Operated for carcinoma of the sigmoid, March 28, 1955. Died of uremia. Blood urea nitrogen 217 mg., probably resulting from transfusion. Postmortem: Bilateral atelectasis.

Case 4.—Mr. J., aged fifty-nine. Operated for obstructing carcinoma of the cecum with perforation and abscess. Poor liver function, extensive weight loss. Died of atelectasis and circulatory collapse. Abdomen remained normal.

There was no mortality in the twenty-one cases operated upon for non-cancerous lesions. (Of course, there should not have been any because

TABLE VI. CARCINOMA OF TRANSVERSE COLON—RESULTS

Number of Patients	Living and Well	Survival
Operable—8	5	1 (8 yrs.) 3 (5 to 7 yrs.) 1 (2 yrs.) 1 died, 2 yrs. lung metastasis 1 left hospital o.k. (senile), could not be followed
Palliative—3		1 died, 48 hrs., cerebral hemorrhage 1 to 2 yrs.

they were not depleted like advanced cancer cases are.) It is quite apparent that these cancer patients died primarily as a result of their poor condition and not from the surgery.

Conclusion

1. A review of twenty years of surgery of the colon has been presented.

2. In eighty-one cases the anastomosis was done by the Murphy button technique. Sixty of these were carcinoma and twenty-one were not malignant.

3. A follow-up and analysis has been done of the carcinoma cases.

4. The technique has been presented quite in detail so that anyone who chooses to use this method should be properly informed.

References

1. Mummery, P. Lockhart: Diseases of the Rectum and Colon and Their Surgical Treatment. Page 776. New York: Wood, 1923.
2. Johnson, J. A.: Electrocoagulation of carcinoma of the rectum and sigmoid. Minnesota Med., 18: 487 (July) 1935.
3. Johnson, J. A.: Treatment of cancer of the rectum by electrocoagulation. Wisconsin M. J., 36:430 (June) 1937.
4. Madison, Mitchel S., Dockerty, Malcolm, Waugh, John: Venous invasion of carcinoma of rectum, evidenced by venous radiography. Surg., Gynec. & Obst., 99:170 (Aug.) 1954.
5. Grinnell, R. S.: The spread of carcinoma of the colon and rectum. Cancer, 3:641 (July) 1950.
6. Grinnell, Robert S.: Distal intramural spread of carcinoma of rectum and sigmoid. Surg., Gynec. & Obst., 99:421 (Oct.) 1954.
7. Johnson, J. A.: Tumors of the jejunum. Minnesota Med., 20:697 (Nov.) 1937.
8. Cole, W. H.: Recurrence of carcinoma in colon and proximal rectum following resection for carcinoma. A.M.A. Arch. Surg., 65:264 (Aug.) 1952.

The Prognostic Value of Leukocy udi
Treated with Rad osp

● *Studies of leukocytic activity in polycythemia vera allow classification of the disease into four subdivisions. This is of some prognostic importance, as the incidence of long remissions is much higher when the polycythemia is of the simple type. When granulocytic hyperplasia is present, the incidence of therapeutic failure is higher, more radiophosphorus is needed for control, and the greater is the chance for development of either a leukemoid state or acute leukemia.*

EXPERIENCE with radiophosphorus in the treatment of polycythemia vera shows considerable variability in response and outcome in individual cases. Objective remissions of at least one year's duration have occurred in 74 per cent of the treated patients: 45 per cent obtained remissions lasting from one to two years as a rule, and 29 per cent obtained remissions of three years or more; 26 per cent failed to obtain adequate remissions.

There were eighty deaths among 230 patients whose fate was known as of January 1, 1956. Twenty per cent of the deaths were caused by acute leukemia and 32 per cent by various chronic leukemoid states such as myeloid metaplasia or chronic myelocytic leukemia. Another seventeen patients were known to be living with the chronic leukemoid states.

The purpose of our study was to determine whether or not any features seen on initial examination of the patient would cast light on the extent of remission, on individual sensitivity to radiophosphorus, and on the patient's ultimate fate.

Initial factors such as size of the spleen, erythrocytic volume, plasma volume, leukocyte count, platelet count, uric acid metabolism, and previous duration and treatment of polycythemia vera were considered. Size of the spleen and uric acid metabolism are related as single features when they are of considerable magnitude; and, of course, they are related to leukocytic activity. Patients who had experienced long duration of polycythemia vera prior to treatment with radiophosphorus also showed evidence of increased leukocytic activity, as did patients who had had extended treatment with phlebotomies or phenylhydrazine. The initial height of erythrocytic and plasma volumes does not seem to have any prognostic value nor does the platelet count.

Evidence of leukocytic activity seems to be the most indicative single feature. Our basis of reporting is based on quantitative and differential leukocyte counts in the peripheral blood as these are technically easy to obtain and available to us in subsequent reports from elsewhere.

Our method of reporting leukocyte values requires explanation. The leukocyte count as commonly used is relative to the total blood volume. If we are to evaluate leukocytosis in a disease in which total blood volume is affected, as it is in polycythemia vera, the leukocyte count must be reported in absolute terms. This may be effected by multiplying the white blood cell count per cubic centimeter by the total blood volume per kilogram of body weight.

Thus, relative leukocyte counts of less than

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ocytudies in Polycythemia Vera
Radiophosphorus

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15,000 cells per cubic millimeter are converted into two classes: the class in which the number of circulating leukocytes is 10^9 or less per kilogram, which we consider to be in the normal absolute leukocyte range; and the class in which the number of circulating leukocytes, although occult to the ordinary methods of counting, is more than 10^9 per kilogram, which we consider to be in the range of absolute leukocytosis.

Counts of more than 15,000 leukocytes per cubic millimeter are obviously increased by both relative and absolute standards.

Cases showing myeloid immaturity in excess of 1 per cent of the differential leukocyte count are considered separately.

This gives us the following fourfold classification of polycythemia vera: (1) simple polycythemia vera, (2) occult leukocytic polycythemia vera, (3) gross leukocytic polycythemia vera and (4) leukemoid polycythemia vera. In simple polycythemia vera the absolute leukocyte count is 10^9 or less circulating leukocytes per kilogram. Myeloid immaturity in the peripheral blood does not exceed 1 per cent. In occult leukocytic polycythemia vera the absolute leukocyte count exceeds 10^9 circulating leukocytes per kilogram but the relative leukocyte count does not exceed 15,000 leukocytes per cubic millimeter. Myeloid immaturity in the peripheral blood does not exceed 1 per cent. In gross leukocytic polycythemia vera, the relative leukocyte count is 15,000 leukocytes per cubic millimeter or more, but myeloid immaturity in peripheral blood does not exceed 1 per cent. In leukemoid polycythemia vera, myeloid immaturity is noted in the peripheral blood in excess of 1 per cent of the differential leukocyte count. Leukocytosis may or may not be present.

TABLE I. LEUKOCYTE VALUES AT INITIAL EXAMINATION AND REMISSIONS AFTER TREATMENT WITH RADIOPHOSPHORUS

Leukocyte Values	Remissions, Per Cent of Cases						Total Cases
	None		Annual or Biennial		3 Years or More		
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	
Simple polycythemia vera	12	17.4	25	36.2	32	46.4	69
Occult leukocytic polycythemia vera	12	17.2	39	55.7	19	27.1	70
Gross leukocytic polycythemia vera	20	40.0	24	48.0	6	12.0	50
Leukemoid polycythemia vera	13	52.0	5	20.0	7	28.0	25
Total	57		93		64		214

Remissions

When this classification is applied to a study of the remissions, we note that the rate of failure is the same for both the simple and the occult leukocytic types, but the incidence of long remissions is much higher in the group having simple polycythemia vera (Table I). Failures are progressively greater among patients having gross leukocytosis and even more so if the polycythemia is leukemoid.

It is interesting to note, however, that long

remissions were more frequent in the leukemoid group than in the gross leukocytic group. The leukemoid type seems to be more labile than the gross leukocytic type.

the leukemoid type became and remained relatively simple in type (Table III).

The incidence of chronic leukemoid states is rather low for the simple type, similar for the

TABLE II. LEUKOCYTE VALUES AT INITIAL EXAMINATION AND THE RADIOPHOSPHORUS INDEX IN CASES WITH AT LEAST A ONE-YEAR REMISSION

Initial Type of Polycythemia Vera	Mean P^{32} Index Per Year								Total Cases
	Less Than 3.0 mc.		3.0-5.9 mc.		6.0-8.9 mc.		9.0 mc. and Above		
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	
Simple	43	74.0	12	20.7	1	1.8	2	3.5	58
Occult leukocytic	24	41.5	25	43.0	6	10.3	3	5.2	58
Gross leukocytic	11	38.0	14	48.1	3	10.4	1	3.5	29
Leukemoid	7	53.8	4	30.8	1	7.7	1	7.7	13
Total	85		55		11		7		158

Sensitivity to Radiophosphorus

To measure the patient's sensitivity to radiophosphorus (P^{32}) we employ the radiophosphorus index, which is simply the total amount of radiophosphorus given divided by the total time of treatment (Table II). The result is expressed as millicuries per year. A high percentage of the patients having the simple type of polycythemia vera showed an index of less than 3 mc. per year. In this same index the percentages for occult and gross leukocytic types are almost the same; the percentage is somewhat higher for the leukemoid type, again indicating that leukemoid polycythemia is more labile.

Outcome

The over-all picture of resulting status also shows a definite relation to leukocytic types: 85 per cent of the cases of simple polycythemia vera remained as relatively simple; 62 per cent of the cases which were initially occult leukocytic became and remained relatively simple, while only 44 per cent of the cases of gross leukocytic polycythemia vera and 28 per cent of the cases of occult and gross leukocytic groups, and higher for the leukemoid type of polycythemia vera.

The incidence of acute leukemia is interesting: it is most marked in the occult leukocytic and leukemoid groups (10 to 12 per cent) and low in the gross leukocytic group where this sequela developed in only one case in fifty cases.

In general, these findings are not surprising when one considers that polycythemia vera may involve myeloid elements other than the erythrocytic element. These findings would suggest that the more involvement there is with granulocytic hyperplasia, the higher is the incidence of failure, the higher is the requirement for more radiophosphorus in control, and the greater the chance that either a chronic leukemoid state or acute leukemia will develop.

A partial exception is seen in the gross leukocytic group in which the incidence of acute leukemia is the lowest for any of the groups. In this group, too, it is often difficult to control leukocytosis, although the erythrocytic excess may be controlled. The potential here would seem to be directed largely toward the chronic leukemoid state.

TABLE III. LEUKOCYTE VALUES AT INITIAL EXAMINATION AND ON JANUARY 1, 1956

Leukocyte Values, Initial Examination	Leukocyte Values on January 1, 1956								Total Patients
	Simple Polycythemia Vera		Leukocytic or Leukemoid Polycythemia Vera		Chronic Leukemoid States		Acute Leukemia		
	Number of Patients	Per Cent	Number of Patients	Per Cent	Number of Patients	Per Cent	Number of Patients	Per Cent	
Simple polycythemia vera	58	85.3	2	2.9	4	5.9	4	5.9	68
Occult leukocytic polycythemia vera	43	62.3	3	4.3	16	23.2	7	10.2	69
Gross leukocytic polycythemia vera	22	44.0	14	28.0	13	26.0	1	2.0	50
Leukemoid polycythemia vera	7	28.0	4	16.0	11	44.0	3	12.0	25
Total	130		23		44		15		212

The Treatment of Scleroderma

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When a person resembling a mummy enters a physician's office, the diagnosis probably is scleroderma. Localized scleroderma usually is self-limited and does not endanger life. In the generalized form, vascular changes and homogenization of the connective-tissue collagen pose a therapeutic problem. The authors discuss how to reduce edema and sclerosis and to control the vascular symptoms in this disease.

THE nonsurgical management of certain diseases such as systemic lupus erythematosus, dermatomyositis, and periarteritis nodosa has improved in recent years. The use of steroid compounds and, in the instance of lupus erythematosus, antimalarial drugs has been effective in controlling, if not curing, many of the symptoms of these so-called collagen diseases. Scleroderma usually has been grouped with these pathologic processes; but although some progress in the treatment for this condition has occurred, it has been pedestrian in comparison with the sometimes dramatic symptomatic responses of the other aforementioned diseases to adrenocortical hormonal therapy.

Treatment usually is unsatisfactory in diseases whose etiology is obscure. Because so little is known of the pathologic mechanism of the terrifying mummification of scleroderma, the patients are overly receptive to any active therapeutic attempt and the doctor often is eager to judge favorably any response during a program of therapy. Also, day-to-day variations in edema and other signs of the disease process make it difficult to estimate accurately small changes. These factors account for the large number of therapeutic agents for which effectiveness in scleroderma has been claimed, examples of man's imagination overreaching his capacity for critical thinking.

Forms of Scleroderma

The cornerstone of the therapy of any disease process is the diagnosis. Various forms of sclerosis are organized in the table. Those localized to the skin are quite distinct from progressive systemic sclerosis.

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Cutaneous.—Linear scleroderma is a developmental cutaneous anomaly and may occupy a dermatome. In the form of hemiatrophy, it may be associated with loss of mesodermal structures localized to one side of the body. In some instances, because of a paramedian location on the scalp and a peculiar atrophic appearance, it is called a "coup de sabre."

TABLE I. CLINICAL FORMS OF SCLERODERMA

Cutaneous
Linear scleroderma
Coup de sabre
Hemiatrophy
Localized and generalized morphea
Systemic
Acrosclerosis (associated with Raynaud's phenomena)
Diffuse scleroderma

Localized morphea, with its violaceous border and ivory-hued sclerotic center, is the most characteristic and frequent form of sclerosis in the skin. Occasionally multiple plaques of this process occur, and for this the term "generalized morphea" has been used. No systemic changes are found.

Systemic.—The association of Raynaud's phenomena with scleroderma has given rise to a clinical variant of the systemic disease, known as "acrosclerosis," in which the skin of the acral regions—the face, the upper part of the chest, the hands and forearms, and occasionally the feet—is principally involved.[1] The onset is insidious; sometimes the Raynaud phase appears as the only sign for years before the development of sclerosis. The process affects women three times as often as men.

Contrasted to acrosclerosis is a form of systemic sclerosis without vasomotor changes which is known as "diffuse scleroderma." In this the skin

has a yellowish, waxy hue and the acral areas, while not completely spared, are only incidentally involved in relation to a major and rapid involvement of the trunk and upper parts of the extremities.[2]

The visceral lesions associated with these systemic types of scleroderma have been reviewed adequately elsewhere.[3-5] Suffice it to say that the principal organs of involvement include the submucosa and muscular layers of the gastrointestinal tract,[6] the interstitial fibrous tissue of the lungs,[7] the myocardium,[8] and more rarely the skeletal muscle and kidneys.

Therapy for Cutaneous Scleroderma

No satisfactory therapy for localized scleroderma is known. It is possible to assure the patient that this process will not endanger life and usually is self-limited. Recently, some success has been gained by use of the antiphlogistic action of antimalarial compounds. No effect may be expected if some response to 250 mg. of chloroquine (aralen) daily is not seen within three months. Routine precautions for the administration of antimalarial agents should be observed.

Therapy for Systemic Scleroderma
(Progressive Systemic Sclerosis)

The treatment of systemic scleroderma is directed toward reduction of the edema and the sclerosis and control of the vasomotor symptoms. By these means it is hoped to restore function of the affected part, for in almost every instance the limitation of function occurs as a consequence of such local conditions. When it is realized that both the obliterative vascular changes and a widespread homogenization of the connective-tissue collagen occur as almost irreversible pathologic processes, the approach to therapy is seen as a formidable challenge.

Maintenance of Circulation.—In acrosclerosis, a major part of the therapeutic effort is directed to increasing the circulation in the extremities and to preventing vasospastic phenomena. To this end a sojourn in a warm climate is often helpful. The patient's environment, wherever he lives, should be maintained at 76° F. or above. Cold must be avoided; housewives must avoid such tasks as hanging out the wash or putting the hands in the refrigerator.

Certain vasodilating agents provide a basic means of controlling vascular spasm. Of these, dibenzyline is the most satisfactory because it can be given orally and because a persistent, adequate effect results in many cases. Ten mg. of dibenzyline three times a day is an adequate beginning dosage. This may then be increased to tolerance or until adequate warming effect is observed. However, it is by no means universally effective and in some instances has to be discontinued because of unpleasant side effects. Other adrenergic blocking agents such as tolazoline and phentolamine have been used, but these have a higher incidence of side reactions on local tissues and have a much shorter effect on vasospasm. The ganglion-blocking agents, tetraethylammonium and hexamethonium, cannot be used except for short periods because of the appreciable systemic effect which they produce in dosages of therapeutic adequacy. Other vasodilating agents, such as nitrites, have been administered systemically as well as by inunction without success. In many instances whiskey by mouth is a satisfactory dilator, acceptable both to the patient and to the physician.

Physical Therapy.—In the effort to reduce sclerosis, physical therapy is extremely important. Together with heat and massage, a graded series of exercises suited to the capability of the part is necessary. Paraffin baths or the heating effect of diathermy or ultrasound may be used. Many observers feel that simple measures such as surface heat combined with activity of the part are sufficient and entail less danger to the skin.

Chelation.—A new method of treatment of scleroderma by chelation has been reported recently by Klein and Harris.[9] This involves the use of edathamil disodium (calcium disodium) versenate by intravenous infusion. Although chelation lowers blood calcium levels, it has become apparent that patients with scleroderma who have no obvious calcium deposit are benefited nevertheless. Our studies with disodium versenate will be reported in detail elsewhere.[10] At present it may be considered that 40 per cent of our cases of acrosclerosis have responded to therapy in a definite and satisfactory way. This includes improvement in esophageal motility as well as measurable functional improvement in the surface tissues.

A total of 50 gm. of disodium versenate is

given intravenously in divided doses based on the patient's weight. Usually, 50 mg. per kilogram of body weight may be given by slow intravenous drip in 5 per cent glucose in water each day. A single intravenous dosage may be 2 to 4 gm. The level of the blood calcium is affected very little by correct therapy, and with slow administration we have had no evidence of low blood calcium in more than 200 infusions. No coagulation defects have been encountered. Tests of daily urine samples are needed for evidence of renal irritation. The only unfavorable side effect to date has been renal tubular irritation with albumin, casts, and cells in the urine. The condition returns to normal after a brief rest period.

Relaxin.—The use of relaxin, a hormone found in the serum of pregnant mammals, for the treatment of scleroderma has been documented by Casten and Boucek.[11] This material was found to control vasomotor phenomena, reduce sclerosis, and help the healing of trophic ulceration; but visceral manifestations were not affected. Because the material is costly and difficult to obtain, various workers have used it only on an experimental basis. Casten and Boucek[11] mentioned that most, if not all, of their patients relapsed in time after the therapy had stopped.

Symptomatic Treatment.—In acrosclerosis, gastrointestinal symptoms such as dysphagia are common. Sometimes dilation is carried out. In event of these difficulties, antacids should be prescribed almost routinely to control reflux esophagitis.[12,13] Elevation of the head of the bed is helpful. Occasionally pancreatic extract is helpful for patients with involvement of the small intestine, even though absorption of material through the wall of the intestines does not seem to be impaired. It is advisable to prescribe supplementary vitamins.

The use of steroids in scleroderma is not to be undertaken without serious deliberation. Usually the arthritic symptoms are relieved, the edema subsides to some extent, and the spirit and appetite improve. This is amply evidenced in the reports of Kierland and Hines.[14,15] Yet continued administration of the steroids is hardly justified for these minor therapeutic results, for in the long run the sclerotic process is not changed by adrenocortical hormone administration. However, in some instances with gastrointestinal involvement, with severe arthritis, or with far-advanced pulmonary changes, it is wise to use small doses of steroids for the beneficial effects they may have upon the patient's sense of well-being and upon the progress of the local process. Doses of triamcinolone (aristocort) in the range of 1 mg. four times a day should be sufficient to gauge the effectiveness of this therapy. Low maintenance dosages should be used. Sometimes it is possible to ease the symptoms of severely sclerosed organs by this means, if it is not possible to prevent their involvement.

Surgical Measures.—Surgical treatment of scleroderma is no longer practiced in a routine manner. Benefit from parathyroidectomy has been reported. Benefit from sympathectomy is limited to the Raynaud's phenomena; the sclerosis is not affected. In the past, some of the good results ascribed to sympathectomy in the treatment of scleroderma have been results of treatment of sclerodactylia consequent to Raynaud's disease rather than true scleroderma.

Prognosis

Patients having slowly progressive insidious acrosclerosis with vasospastic phenomena are given a much better prognosis in respect to survival than those having diffuse systemic sclerosis without vasomotor signs and symptoms. It is apparent, however, that any form of systemic sclerosis may be rapidly progressive; and once the cardiac and respiratory organs are severely involved, the outlook is very grave. Calcinosis of the skin and soft tissues occurs in 25 per cent of cases of acrosclerosis and is limited to this form of the systemic disease. Usually it develops only after about ten years, and only those patients with associated vasomotor phenomena live long enough for calcium deposits to form in the soft tissues.

Summary

The modern treatment of scleroderma has been reviewed. The newest procedure, the use of intravenous chelating agents such as disodium versenate, offers some promise. Vasomotor symptoms, when present, must be controlled by symptomatic treatment. Sclerosis of the hands may be improved by physical therapy. Symptomatic treatment with steroids is only rarely indicated, for steroids will not affect the sclerosis. No completely adequate treatment for, or understanding of, progressive systemic sclerosis exists at the present time.

(References are on page 27)

Obstructive Uropathy in Children

● *Extreme variations in prognosis are often seen to depend as much on diagnostic acumen as on the effectiveness of therapy. The ultimate results obtained are both the credit and responsibility of those in general practice as well as their consultants.*

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MUCH of the progress in the field of pediatric urology is due to the increased awareness of pediatricians and general practitioners of the high incidence of urinary tract anomalies and disease. Continued advances in technology now admit complete investigation of the urinary tract even in the newborn infant. The benefits of early diagnosis in infants are even more far-reaching and satisfying than in the adult. Especially is this true in the case of obstructive uropathy where often the simplest procedure done early will prevent the gravest complications. Representative cases of various sites and degrees of obstruction serve to illustrate the urgency of early diagnosis.

In Figure 1, one sees the earliest stages of damage resulting from stricture of the urethral meatus, *i.e.*, extreme dilatation of the distal urethra. This was easily corrected by meatotomy. Too often in the past, irreversible damage to the entire urinary tract had occurred before severe symptoms required investigation. In this particular case, the child (a boy, aged two) was noticed to dance around before each voiding and was brought to the family doctor by a slightly embarrassed mother who was as curious as she was concerned. In view of the patient's age it is likely that the stricture was the result of a meatitis following circumcision and repeated irritation of a small but originally adequate meatus. The incidence of similar cases seems high enough to make routine probing of the meatus advisable (both at the time of circumcision and after healing had occurred), as well as doing a simple meatotomy at the time of operation in questionable cases.

Contracture of the vesical neck is less easily diagnosed until complications appear. Often a single bout of unexplained fever, pyuria or merely enuresis is the only finding. Since it is here that the entire upper urinary tract is jeopardized one must be particularly alert. Figures 2 and 3 are examples of irreversible renal and ureteral damage from prolonged obstruction which caused few symptoms until infection intervened. Extensive dilatation and later elongation of the ureters is evident, along with decompensation of the bladder and ureteral orifices with subsequent vesicoureteral reflux. Current therapy, either radical or conservative, is not adequate to cope with this problem at present, but the degree of concern and study should produce some effective treatment in the near future.

At the moment, the only means of preserving renal function is to detect the obstruction before extensive damage has occurred. Proper therapy is completely effective when employed in time.

In Figure 4*a*, one sees the early stages of obstruction at the bladder neck with dilatation of the bladder and beginning hydroureteronephrosis. Figure 4*b* is the essentially normal excretory urogram taken eight weeks after transurethral resection of the vesical neck. This boy's future health was preserved because the referring physician specifically questioned the mother regarding urinary symptoms during a general examination and discovered that the patient had been dribbling small amounts of urine occasionally for about six months between apparently normal voidings.

The occurrence of upper tract damage is much less frequent in girls than in boys, possibly because the former are more prone to develop symptomatic bladder infections earlier in the progress of obstruction and most of these are seen to have bladders which are trebeculated, infected and more or less atonic. The prevalence of urethrotrigonitis in young girls requires the measurement of residual urine to detect the cases of obstruction which often present identical symptoms. Those that have escaped detection in the past and have been carried with repeated courses of chemotherapy often present themselves in later life, with reflux and renal infection finally instigating complete investigation.

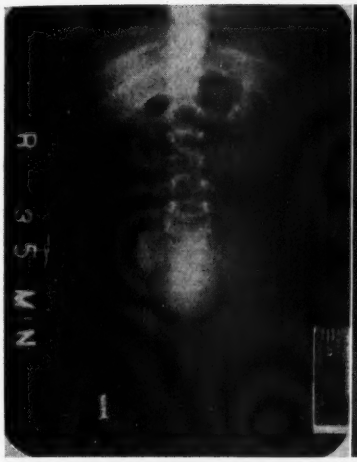


Fig. 1. (J. B.) aged two years. Dancing when urinating. Excretory urograms show stricture of urethral meatus with dilated distal urethra and early dilatation of bladder. Upper tract not yet affected. Results of meatitis following circumcision.

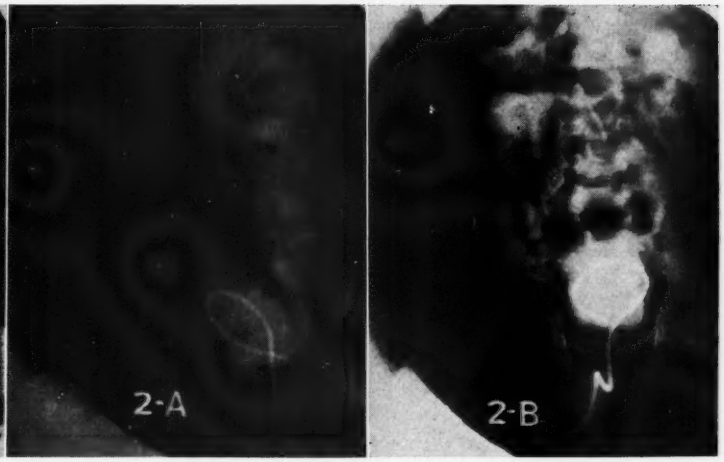


Fig. 2 *a* and *b*. (R. S.) aged two and one-half years. Fever only. Cystograms showed bilateral reflux and marked renal obstruction due to contracted vesical neck. Ultimate prognosis: poor despite operative drainage and correction of obstructive factors.

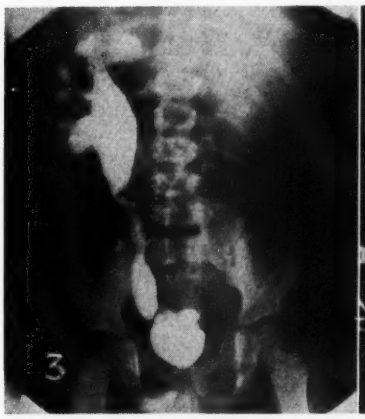


Fig. 3. (D. M.) aged three years. Fever only. Similar case after partial ureterectomy on right still showed reflux which necessitated vesicoureteroplasty; after similar procedure on left patient is improved but still infected. Prognosis: only fair.

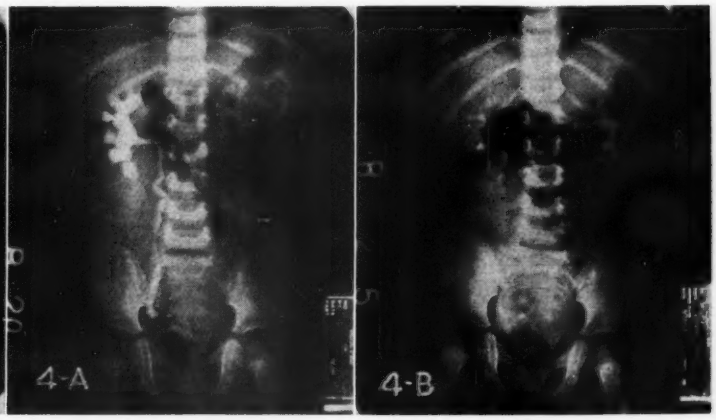


Fig. 4. (M. N.) aged two and one-half years. Occasional urinary dribbling. (*a*) Excretory urogram shows solitary right kidney with early hydroureteronephrosis from distended bladder filling right side of abdomen. Contracted vesical neck corrected by transurethral resection. (b) Eight-week follow-up urogram shows normal upper urinary tract. No residual urine.

This is especially true in cases termed "glomerulonephritis" because of hematuria (with associated albuminuria) preceded by an acute infection elsewhere. The diagnosis of glomerulonephritis can not be assumed until obstructive uropathy is ruled out. Such a case is illustrated in Figure 5, which shows a dilated bladder with reflux to the lower segment of a duplicated right renal pelvis and ureter, secondary to bladder neck obstruction. The duplicated ureters were anastomosed to utilize the better ureter, and a transurethral resection of the bladder neck was done to give a good final result. Presumably earlier diagnosis would have decreased the amount of necessary surgery.

Unilateral ureteral obstruction is often due to ureterocele. Associated with this, one commonly finds duplication of the upper urinary tract. Occasionally prolapse of the ureterocele through the urethra can cause symptoms of intermittent obstruction of the bladder. In each of the illustrated

cases fever was the admitting symptom. In both, extensive studies had been carried out before investigating the urinary tract, since the obstruction was nearly complete and the initial urinalysis had shown only a few pus cells. In the absence of bladder symptoms this obstruction can progress to a marked degree before supervening infection calls for investigation. Adequate resection of the ureterocele, if done early enough, is usually sufficient to restore the obstructed kidney to normal but occasionally sufficient damage has occurred to require nephrectomy. In Figure 6, the latter situation is shown.

Initial resection of the ureterocele permitted catheterization of the obstructed segment and determined the cause of a persistently high fever. The duplication is easily missed on the initial urogram unless one is conscious of the frequency of such an association. Unfortunately, the degree and duration of toxicity in this baby and the presence of ureteropelvic stricture of the lower segment (as well as the dense induration of the ure-

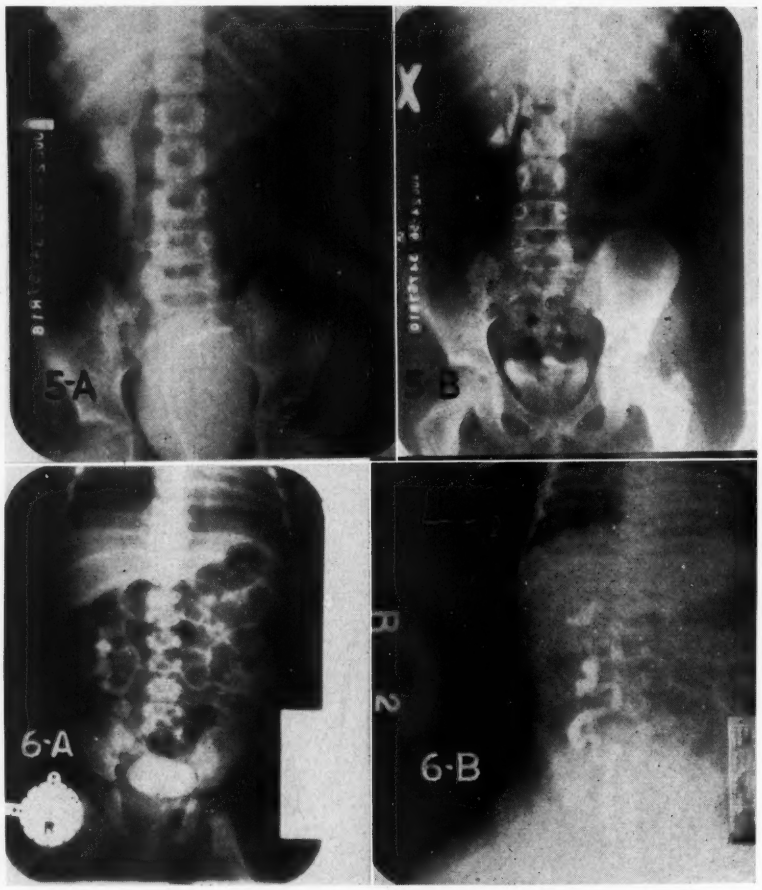


Fig. 5. *(above)* (A. H.) aged six years. Fever, recurrent pyuria and hematuria. *(a)* Cystogram shows dilated bladder with vesicoureteral reflux to lower segment on right due to contracted vesical neck. Ureteral valve to upper segment on right still competent. *(b)* Excretory urogram one year following ureterourecterotomy to utilize good ureter with excision of lower portion of decompensated ureter followed by transurethral resection of vesical neck. Patient asymptomatic and urine sterile.

Fig. 6. *(below)* (M. C.) aged four months. Fever. *(a)* Excretory urogram shows ureterocele and dilated renal calices on right; the latter are due to a congenital ureteropelvic stricture of the lower segment of a completely reduplicated right urinary tract. *(b)* Catheterization of upper segment and ureter following transurethral resection of the ureterocele. Voided urine specimens showed gross pyuria. Catheterized specimens showed only a few pus cells.

ters) did not permit the desired partial nephrectomy and the whole kidney was removed. Reflux up the dilated ureter necessitated later ureterectomy after the patient's condition had improved. She is well at present. In retrospect it is difficult to see how an earlier diagnosis could have been reached to permit less radical therapy but it is always with the greatest reluctance that one sacrifices reparable renal tissue.

Figure 7 shows the rapid restoration of the upper urinary tract in a case where resection of the ureterocele was possible before irreversible damage to the obstructed segment had occurred.

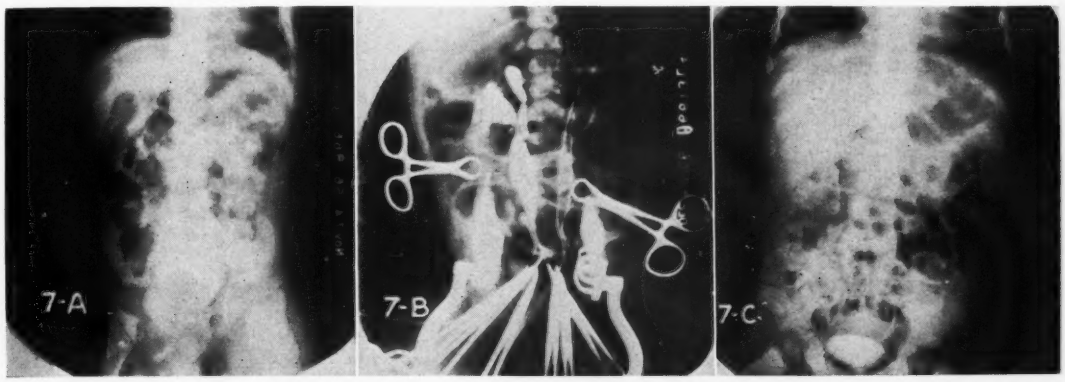


Fig. 7. (R. A.) aged two and one-half years. Recurrent pyuria. *(a)* Large ureterocele did not permit satisfactory endoscopic investigation and resection. *(b)* Suprapubic resection of the ureterocele with catheterization; completely reduplicated upper urinary tracts bilaterally. Ureterocele was associated with upper segment of right kidney. *(c)* Excretory urogram taken eight months later shows essentially normal urinary tract. Urine at present is free of infection.



Fig. 8. (D. L.) aged three years. Recurrent pyuria. Initial retrograde pyelogram shows degree of obstruction that has occurred with few symptoms. Procrastination in this case would have resulted in ultimate loss of the kidney. This patient has responded well to ureteral dilatations and ureteral meatotomy.

Unilateral ureteral obstruction is most commonly due to stricture, usually at the ureterovesical juncture, as illustrated in Figure 8. These respond to cystoscopic dilatations and ureteral meatotomy and such patients have a good prognosis if renal damage is not too extensive. Here again, intermittent bouts of pyuria often permit early diagnosis if adequate investigation is carried out. Hydronephrosis without ureteral obstruction is most often due to ureteropelvic juncture deformity or stricture and a relatively large number of young adults still observed with renal obstruction of various degrees attest to the need for increased awareness of this anomaly in childhood. It has been estimated that between 80 and 85 per cent of uropathy in children and possibly in adults, is due to congenital malformations.[1]

Reports on necropsies performed on children have shown that from 5 to 10 per cent have abnormalities of the genitourinary tract.[2,3] On the basis of existing evidence it is apparent that more thorough investigations of the urinary tract should be made in many instances. Certainly under no circumstances should urinary symptoms of any degree be either blindly treated or ignored.

References

1. Askin, J., Reichelderfer, T., Salik, J., and Merritt, Jules: Indication for excretory urography in children. J. of Pediat., 20:1033, 1957.
2. Campbell, M.: Clinical Pediatric Urology. Philadelphia: W. B. Saunders Co., 1951.
3. Helmholtz, H. F., and Thompson, G. J.: Urinary obstruction and infection among children, importance of their early recognition. Proc. Staff Meet., Mayo Clin., 16:6, 1941.

Use of Intravenous Baird's Solution i agi

● **Uncommon usage of a common anesthetic agent. Good results were reported from this study and the author should make another report when the number of patients is still greater. Anesthesiologists would not recommend this type of obstetrical anesthesia unless administered by an experienced and competent anesthetist who is prepared for intubation and possibly bronchoscopy.**

DURING the period from 1950 to 1954, pentothal sodium with added curare has been used as an induction anesthesia for Cesarean sections at our clinic. After reviewing the literature on this subject, it was decided that a control series of cases in both vaginal deliveries and Cesarean sections should be studied.

Cooley and Schwarz[1] reported the results of 316 maternity cases cared for at Mary's Help Hospital, San Francisco. They used a 2½ per cent solution of pentothal sodium in which the dosage varied from 10 to 40 cc., the average dose being 17 cc. The time interval from the onset of the anesthesia to the time of delivery was a little over three minutes in their cases. The longest time was six minutes and the shortest time one minute. In their studies they believed the following were the advantages of such anesthesia: (1) Induction was rapid and easy, (2) Injection was pleasant, (3) The dosage could be controlled, (4) Recovery was rapid, and (5) It was ideal for patients fearing inhalation anesthesia.

They reported one complication of laryngospasm, and they had one case of postpartum hemorrhage three hours after delivery. Because of the laryngospasm, they routinely gave their patients 1/150 gr. of atropine ten to fifteen minutes before the induction of the anesthesia.

Dippel, Helman, Walters, Wall and Hairston[2] stated that there was no transfer to the fetal circulation of pentothal sodium in the first five minutes of anesthesia; however, there was equal distribution of the anesthetic agent in both the maternal and the fetal circulation at the end of ten minutes. They recommended it should not be used in toxemic patients because the pentothal sodium was destroyed in the liver, and with poor liver function in toxemia, one might get an accumulative effect of the drug. They concluded that the contra-indications for the use of the anesthetic agent were cardiac disease with decompensation, individual idiosyncrasies and toxemia of pregnancy. They used a 2½ per cent solution of pentothal sodium in 350 cases. The dosages varied from 6 cc. to 135 cc. Ninety-one and six-tenths per cent of their cases received a dosage of 10 cc. to 50 cc. Five and four-tenths per cent of their cases received over 50 cc. of the drug. They recommended that pentothal sodium should not be used as a routine anesthetic agent; however, it was relatively safe if the time factors were considered.

In 1938 Kassebohn and Schreiber[3] reported on their use of intravenous anesthesia in obstretrics and they stated that it took forty-five seconds to reach surgical anesthesia with a 5 per cent solution of pentothal sodium. They concluded that there were no ill effects on the infant if delivered within a ten-minute time interval from the onset of the anesthesia.

Schultz and Weinbaum[4] reported 215 cases in which a 2½ per cent solution of pentothal sodium was used. They reported complications of laryngospasm, apnea and patient idiosyncrasies.

Our series of cases consisted of 124 consecutive cases under careful observation and rigid statistical control. We have had approximately 400 cases using pentothal sodium with added curare, however, without the rigid statistical control. Our results in these cases approximate the results in our control group.

n i aginal Deliveries and Cesarean Sections

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The majority of our patients received Demerol, the dosage varying from 50 mg. to 100 mg. and scopalamine, the dosage varying from 1/300 gr. to 1/150 gr. during the course of their labors. Twenty of the 124 patients received nitrous oxide and oxygen analgesia in the second stage of the labor. The ages of the mothers varied from seventeen to forty-four years, the average being twenty-seven years.

The types of deliveries in the series were as follows: 101 outlet forceps, three modified Scanzoni rotations, two low forceps, eight spontaneous vertex deliveries, three spontaneous breech deliveries and six Cesarean sections.

Of the patients delivered vaginally, thirty-two went into spontaneous labor and eighty-six were electively induced. Active labors varied from one to eighteen hours, the average length of labor being 4.9 hours.

In the six Cesarean sections, two cases indicated central placenta previa, one partial oblatio placenta, one uncontrollable toxemia and two were repeat Cesarean sections.

Pentothal sodium with curare, so-called Baird's solution, was used in these deliveries. The solution was prepared using 15 cc. of a 2 per cent solution of pentothal sodium and adding 5 cc. of D-tubo which contains 15 mg. of curare. The exact amount was recorded on the anesthetic record. The largest total dose was 50 cc. and the smallest 8 cc. The average dose was 13.2 cc. of Baird's solution.

The time interval from the onset of anesthesia to the delivery was accurately recorded on the anesthesia record. This time varied from one minute to seven minutes; the average length of time was 2½ minutes.

In 117 of the 124 cases the infant cried and breathed spontaneously without any type of resuscitation, while seven infants had slight to marked delay in respirations. These cases will be discussed in detail. The baby weights varied from 4 pounds to 9 pounds, 10 ounces.

There were no deleterious effects on the mothers with the use of intravenous Baird's solution. They had good anesthetic effect from the drug with no postanesthesia complications.

Deliveries in which the infants showed some evidence of impaired respirations were as follows:

Case 1.—Para 8, aged thirty-two, admitted to the hospital with painless vaginal bleeding. Examination by x-ray revealed she had a frank breech presentation associated with a central placenta previa. The pregnancy was terminated by a low transverse Cesarean section. The patient received a total of 36 cc. of Baird's solution and there was a two-minute interval from the onset of the anesthetic to the delivery of the infant. The baby did not cry spontaneously; however, respirations were established within one minute. The neonatal course was uneventful.

Case 2.—Para 10, aged thirty-two, was admitted to the hospital for elective induction of labor. The total labor was six and one-half hours with the patient receiving the routine demerol therapy. The pregancy was terminated by delivery of an right occipito-anterior (ORA) vertex presentation by outlet forceps. A total of 12 cc. of Baird's solution was used. The time interval from onset of the anesthetic to the delivery was six minutes. There was less than a one-minute delay in establishing respirations of the infant. The neonatal course was uneventful.

Case 3.—Para 2, aged twenty-one, was admitted to the hospital in active labor. Total labor was three hours associated with moderate to heavy vaginal bleeding in the second stage. The patient received the usual demerol

and scopalamine medication. Delivery was accomplished by outlet forceps of a left occipito-anterior (OLA) presentation. A total of 14 cc. of Baird's solution was used. The time interval from the onset of the anesthetic to delivery was one and one-half minutes. There was approximately a two-minute delay in established respirations. The baby was pale and flaccid at the time of delivery. The placenta showed evidence of a 25 per cent premature separation when examined. The neonatal course was uneventful.

Case 4.—Para 7, aged thirty-three, was admitted to the hospital with painless vaginal bleeding. The diagnosis of central placenta previa was established by x-ray and a sterile pelvic examination was made. The pregnancy was terminated by a low transverse Cesarean section. A total of 36 cc. of Baird's solution was used. There was a five-minute interval between the onset of the anesthetic and delivery of the infant. There was a ten-minute delay in established respirations. Resuscitation was accomplished by pharyngeal aspiration, oxygen and mouth-to-mouth resuscitation. The neonatal course was uneventful.

Case 5.—Para 2, aged twenty-five, was admitted to the hospital and electively induced. Total labor was two hours. The patient received the usual demoral and scopalamine medication. Delivery was accomplished spontaneously of a left sacro-anterior (LSA) frank breech. A total of 17 cc. of Baird's solution was used. There was a seven-minute interval between the onset of the anesthetic and delivery of the infant. Respirations were delayed slightly over one minute, however, the baby responded well to pharyngeal aspiration and oxygen therapy. The neonatal course was uneventful.

Case 6.—Para 0, aged twenty-one, was admitted to the hospital in active labor. The patient had a nine and one-half hour labor under the routine demerol and scopalamine medication. A total of 12 cc. of Baird's solution was used. There was a four and one-half minute interval between the onset of the anesthetic and the delivery of the infant. The pregancy was terminated by low forceps of an OLA vertex presentation. Respirations were delayed slightly over one minute. The neonatal course was uneventful.

Case 7.—Para 2, aged twenty-one, was admitted to the hospital in active labor. There was a total labor of two and one-half hours during which the mother received the routine demerol medication. A total of 12 cc. of Baird's solution was used. Delivery was accomplished spontaneously of a right sacro-anterior (RSA) frank breech presentation. There was a five-minute interval between the onset of the anesthetic and the delivery of the infant. There was approximately a one-minute delay in respirations. The infant was cyanotic at the time of delivery, but responded well to pharyngeal aspiration and oxygen therapy. The neonatal course was uneventful.

Of the 124 infants delivered there was only one neonatal death. This was an erythroblastotic infant who expired during the process of an exchange transfusion approximately two hours after delivery.

Delivery Technique

Our technique is as follows: The patient is placed in a lithotomy position on the delivery table. The perineum is prepared in a routine manner and draped. The patient is catheterized and the obstetrician carries out a vaginal examination before the anesthetic is started. Delivery is not attempted until the operator is convinced that he can deliver the patient within five minutes from the onset of the anesthetic. On some of the patients we have had to use nitrous oxide and oxygen analgesically to keep them comfortable until we could carry out the delivery. Out of 124 cases there were only seven infants which showed any evidence of delayed respirations. We believe that six of these cases were due to obstetrical complications, such as placenta previa, placenta oblatio or toxemia. In only one infant did we feel that the delay was due to the anesthetic agent or to the time interval between the onset of the anesthetic and the delivery of the infant. In reviewing the statistics in this series of 124 cases, we believe that intravenous Baird's solution is an ideal anesthetic agent in selected cases.

Summary

We have reviewed 124 cases in which intravenous Baird's solution has been used in vaginal delivery or Cesarean sections. We have discussed our results, and have compared them with other series of cases. We believe that it is a safe anesthesia when our technique is followed.

References

1. Cooley, C. L. and Schwarz, H. F.: Sodium Pentothal Anesthesia in Obstetrics. West. J. Surg., 56:278 (May) 1948.
2. Dippel, A. L., Helman, R. J., Wolters, C. E., Wall, H. A. and Hairston, F. H.: Sodium Pentothal Anesthesia for Selected Vaginal Deliveries. Surg., Gynec. & Obst., 85:572 (Nov.) 1947.
3. Kassebohn, F. A. and Schreiber, M. J.: Intravenous Anesthesia in Obstetrics. Am. J. Surg., 40:377 (May) 1938.
4. Schmidt, R. T. F. and Weinbaum, J. A.: Pentothal Sodium Anesthesia for Vaginal Deliveries. U. S. Armed Forces M. J., 1:874 (Aug.) 1950.

Testing Visual Acuity of the Pre-school Child

Visual acuity can be tested at any pre-school age. The techniques are quite simple. The rewards of early detection of acuity defects are measured in terms of a lifetime of preserved vision.

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THE testing of visual acuity in the pre-sccool child constitutes an important phase of visual screening in children. Because of the immaturity of the child's judgment, such tests must be considered approximations. Nevertheless, they are of value in that they serve as indications of visual difficulty and suggest the need for more detailed information.

In this presentation, I wish to consider the tests designed for the various age levels, extending from the newborn to school age. In the newborn and the child a few months old, a visual test may be used to determine roughly the presence or absence of vision. In doing such a test, a small flashlight is used. The flashlight is moved a few feet in front of the baby's eyes and if vision is present, the child is attracted by the light and his eyes will follow it in its movements. Such a test is of limited value, but serves to demonstrate the presence of vision.

In the somewhat older child, the use of small brightly colored objects, such as a rattle, at variable distances attracts the attention and indicates the presence of vision.

In the child from one to two years, the use of a colored marble, rolled on the floor, is very helpful in indicating the presence of vision and the degree. In such a test, the child follows the marble which can be placed at varied distances.

In the two to three-year-old child, the use of familiar objects is useful. Such objects as a safety pin, piece of candy, button, et cetera, held at various distances can be used. One eye should be tested at a time.

In the three to four-year-old child, the use of a circular chart is helpful (Fig. 1). In this method, the child is told to recognize the different positions of the hand which is printed on the chart. This hand is 1/2 inch in height and should be recognized at 15 to 18 feet. Printed directions are given on the reverse side. The best method of testing is

by first familiarizing the child with the test at home under the supervision of the mother. She explains the test to the child and after the child becomes familiar with it, each eye is tested. The mother usually moves backward varying the position of the hand, the child indicating with his hand, the position of the hand on the chart. The importance of the test is not primarily the distance at which the target is recognized, but rather the difference between vision of the eyes tested separately.

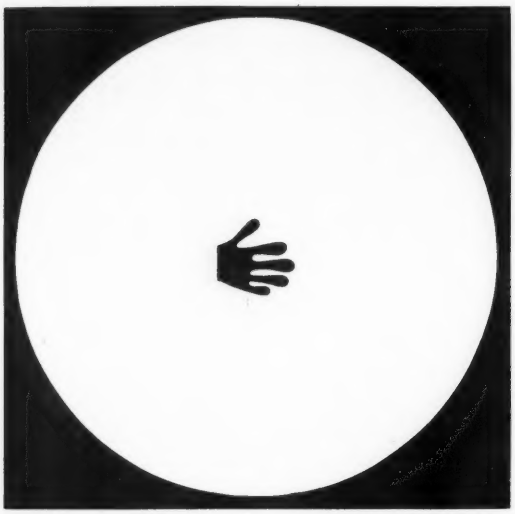


Fig. 1. Circular chart used for testing visual acuity of pre-school children.

For the five to six-year-old child, an illiterate E is substituted for the hand, and the test is carried out similarly to the previous test (Fig. 2).



Fig. 2. Illiterate E chart.

The hand and E tests are done at home. The test is repeated a number of times. The mother keeps record of the results and reports her findings to the doctor, who can then check her findings if any question exists as to the accuracy of her findings.

The five and six-year-old-child can be tested also with a chart on which symbols of various sizes are printed. The chart is attached to the wall at 20 feet with at least fifteen candles of illumination. A piece of cardboard, 6 inches square, with an opening in it is placed over the individual symbols, thus permitting only one symbol to be exposed at a time.

The seven-year-old child may also be tested by using the E symbol, but if he knows the alphabet, the latter method may give more accurate results.

It must be stressed that these tests are approximations and are suggestive. It is also important to point out that the difference in visual acuity between the eyes is as significant as the distance at which the target is recognized.

So frequently the parents of a visually-neglected child accuses the family doctor of having repeatedly ignored the eyes during various routine examinations although the teeth and other phases of the examination are religiously watched. To avoid that criticism, it is my suggestion that the circular chart be passed out to all parents who come to the physician for a routine examination of their child. Because the test is done chiefly by the mother, it takes only a few moments of the doctor's time, and frequently reveals valuable information.

We have, therefore, in the visual acuity a valuable index of the pre-school child's eyes. It is important to stress that the earlier a visual defect is discovered and treated, the better the result because visual development occurs at a very early age and if the defect is not treated until school age, permanent damage is done to the eyes and the child goes through life an ocular cripple.

Psychosis due to Bilateral Carotid Artery Occlusion

• Organic psychosis, if promptly diagnosed and correctly treated, may be followed by dramatic recovery. Unfortunately, the underlying organic disease is too often irreversible. Nevertheless, the clinician should look for organic conditions which could cause sudden disorientation. Presented here is a case of acute psychosis related to the unusual cause of bilateral occlusion of the carotid arteries.

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ON THE BASIS of the presenting symptoms, it is frequently difficult to differentiate between the functional and organic causes of a psychosis. The differential diagnosis is possible in many instances by a careful psychiatric and neurological examination but in some patients intensive investigation with special testing is necessary to determine the etiology of a psychosis.

An unusual cause of such a psychosis is presented in the following case report in which the patient presented a psychotic picture which was initially interpreted to be functional in origin and only subsequently was the organic nature of her psychosis appreciated and recognized. Prior to her demise, the presence of unilateral obstruction of the carotid artery was established but only at postmortem was the bilateral nature of her carotid artery obstruction demonstrated.

An excellent review on bilateral carotid obstruction is present in the article by Clarke and Harrison[1] in which the literature on this condition is reviewed and to which the authors have added the cases of two patients of their own. The authors reviewed sixty-nine cases collected from the literature. In 29 per cent of the patients reviewed in the literature, mental changes were encountered. The most common psychiatric picture was that of progressive dementia which was difficult on a clinical basis to distinguish from presenile dementia. Less frequently, hallucinations, delirium and lesser mental symptomatology such as mental slowing and the patient being depressed and languid are encountered. In addition to mental changes, a variety of other neurological abnormalities may be detected with bilateral carotid obstruction. Hemiplegia, paraplegia and quadraplegia have been described with accompanying sensory and visual deficiencies of varying severity. These features are frequently transient and phenomena occurring on one side of the body and then on the other side are characteristic. In the early stage, however, signs may be conspicuously absent and on this account, a "functional" illness may be diagnosed. The resultant clinical picture is dependent upon the efficiency of the collateral circulation and on the speed of the onset of the arterial occlusions. Among the various etiologies reported for this condition are: pulseless disease, atherosclerosis and one case of giant cell arteritis, and such infrequent causes as occlusion of the carotid arteries by large thyroid tumors and thromboangiitis obliterans.

Case Report

Clinical Features and Course.—This woman, aged sixty, was in good health until nine weeks prior to her demise. At that time she became acutely psychotic and a few days later was seen in the office. At the time of her initial examination in the office, the patient was hallucinating and was delusional, stating that people had accused her of marrying her husband for his money. Complete neurological examination at that time was negative. The systolic blood pressure was 250 mm. and the diastolic 145 mm. of Hg.

The patient was admitted to a psychiatric hospital. The electrocardiogram and the blood urea nitrogen determinations were negative as were routine blood and urine studies. After eight electroshock treatments her condition markedly improved and for one week her mental symptoms cleared. However, the patient continued to have feelings of guilt about something she had said while ill. During this entire period there had been fluctuations in her blood pressure with the systolic pressure changing between normal and 200 and corresponding variation of the diastolic pressure. After this one week of being relatively free of mental symptoms, the patient had a relapse. She became confused, and wandered about aimlessly, at times crawling

over the side-rails of her bed. Her hallucinations returned. At this time the patient was seen by an internist, who performed a benzodioxaine test with negative results. He felt that she did not have essential hypertension or a pheochromocytoma. The possibility of a central cause of hypertension was considered. The patient received two more electroshock treatments but there was no improvement in her condition. Following the resumption of electroshock therapy and following the second treatment, it was reported in the afternoon that the patient did not appear to move the left side of her body. The author saw the patient within the hour and could not find any abnormalities and the patient was able to move her left arm and leg freely. The patient gradually became mute and refused to eat and would not get out of bed, although when helped out of bed could walk.

The patient was transferred to Mt. Sinai Hospital (Minneapolis) for further investigation. At this time vascular central nervous system disease and a brain tumor were considered in the differential diagnosis. An angiogram was performed on December 17, 1952 and revealed occlusion of the right internal carotid artery. The patient was conscious following the angiogram and remained that way until following a drop in blood pressure she became comatose and developed a left hemiparesis. Within the next thirteen-hour period the patient developed a dilated right pupil and bilateral Babinski signs. There was weakness of the left arm and leg and some flattening of the left nasolabial fold. On painful stimuli, the left arm and left leg initially moved. The patient developed increasing respiratory difficulty which initially responded to intravenous aminophyllin. Projectile vomiting developed. The pulse became slower and weaker and the pupils were both widely dilated, the right remaining slightly larger than that on the left. Cyanosis developed and terminally, there was a large bloody emesis. The patient succumbed at 4:20 a.m. on December 19, 1952.

Pathological Examination.—The most significant abnormalities in the necropsy were restricted to the carotid arteries and the brain and were reported as follows: The right internal carotid was occluded by an old gray-tan organized thrombus that arose just above the origin of the external carotid branch; this old thrombus extended cephalad for a distance of 2.5 cm. and completely occluded the lumen. Extending proximally there was a softer purplish-red thrombus, undoubtedly retrograde in pathogenesis, which extended for a distance of approximately 6 cm. This completely occluded the lumen, except at its most caudate tip where it ended in a "rat-tail" manner. Another similar purplish-red, rather soft, thrombus extended cephalad from the older thrombus in the right internal carotid artery; this extended the entire course up into the origin of the Circle of Willis where the thrombus extended into the anterior cerebral and middle cerebral arteries on the right.

The left common carotid artery was occluded at its origin from the arch of the aorta by a soft purplish-red thrombus. This extended for a distance of 5 cm., where it could no longer be traced (this may have been more apparent than real, due to partial embalming attempted through both carotid arteries before examination of these branches). There was a similar old organized gray-tan thrombus that completely occluded the lumen of the left internal carotid artery, arising just at the bifurcation and extending for a distance of 2 cm. The external carotid branch was not occluded at this point. No other thrombi were found in the left common carotid artery or its branches.

The vessels at the base of the brain and Circle of Willis showed thrombosis of the right carotid artery, and the right middle and anterior cerebral branches as noted above. The remaining major branches were not grossly thrombosed. The vertebral and basilar artery and Circle of Willis showed only mild to moderate artherosclerosis, but no occlusion.

The pituitary showed an area of necrosis which may have been due to ischemia on the basis of the carotid artery thrombosis. Not all of the pituitary was necrotic.

External examination of the brain showed both cerebral hemispheres to be softened and enlarged with marked flattening of the convolutional pattern, particularly on the right. There was definite tentorial notching and cerebellar conus.

Coronal sections of the entire brain showed diffuse softening of the entire right cerebral hemisphere, most marked in the distribution of the right middle cerebral artery, wherein there was complete softening of the superior half of the internal capsule and softening with hyperemia of the cortex of the greater part of the frontal and parietal lobes. The right occipital pole appeared intact. The left cerebral hemisphere showed suggestive softening in the more central parts but this may have represented poor fixation. Sections of the brain stem showed multiple hemorrhages, particularly in the dorsal half of the mid-brain and upper half of the pons. Sections of cerebellum gave negative findings.

Microscopic.—Sections taken from the right internal carotid artery showed severe atherosclerosis with large plaque causing marked attenuation of the lumen. In addition, there was a fresh thrombus within the remaining lumen. The large plaque showed evidence of an old intramural hematoma which caused the expanding plaque to reduce markedly the size of the original arterial lumen. As a matter of fact, in some sections the lumen and its thrombus occupied a much smaller area than the atheromatous plaque with its old intramural hematoma which contained cholesterin clefts. The external carotid artery on these sections also showed severe atherosclerosis and attenuation of the lumen.

Sections taken from the left internal carotid artery showed similar severe atheromatous plaques attenuating the lumen. The lumen was further occluded in some sections by an antemortem thrombus which was of approximately the same age as the thrombus on the right side, but in which most erythrocytes had undergone hemolysis. The aorta showed moderately severe ulcerating and partially calcified atherosclerosis of the lumbar portion. There were no thrombi.

Microscopic sections of branches of the right internal carotid artery, including the middle and anterior cerebral arteries, showed no thrombus formation. Sections of

the cortex, white matter, basal nuclei and thalamus on the right, showed diffuse and patchy pallor and vacuolization, multiple petechiae and a mild leukocytic response with occasional aggregates of perivascular polymorphonuclear cells. There was no definite macrophage response and the lesion was thus probably less than forty-eight hours old. The sections of similar areas on the left showed less definite evidence of acute encephalomalacia although there was patchy and diffuse pallor and occasional petechiae. Sections of pons showed multiple acute hemorrhages.

Conclusion.—Bilateral thrombosis of the internal carotid arteries with early diffuse malacia of greater part of the right cerebral hemisphere and probably early acute malacia of the left cerebral hemisphere.

Discussion

This patient had evidence of marked chronic obstruction of the bilateral carotid artery systems. Terminally she developed complete obstruction of the carotid artery system with a propagation of the thrombosis on the right to involve the right middle and right anterior cerebral arteries. The dangers of angiography are demonstrated by the rapid downhill course in the patient following this procedure.

Conclusion

A rare case of bilateral occlusion of the carotid arteries is presented. The need for careful differential diagnosis in a patient presenting with a picture of a psychosis is emphasized.

Acknowledgment

The author extends his thanks to Dr. Steven Barron, pathologist, who did the pathological studies on this patient.

Reference

1. Clarke, E. and Harrison, C. V.: Bilateral carotid occlusion. Neurology, 6:705-715 (Oct.) 1956.

THE TREATMENT OF SCLERODERMA

(Continued from Page 15)

References

1. O'Leary, P. A. and Waisman, Morris: Acrosclerosis. Arch. Dermat. & Syph., 47:382-397 (Mar.) 1943.
2. O'Leary, P. A.: Dermatoscleroses. Canad. M. A. J., 48:410-415 (May) 1943.
3. Goetz, R. H.: Pathology of progressive systemic sclerosis (generalized scleroderma) with special reference to changes in viscera. Clin. Proc., 4:337-392 (Aug.) 1945.
4. Beerman, Herman: The visceral manifestations of scleroderma: A review of the recent literature. Am. J. M. Sc., 216:458-475 (Oct.) 1948.
5. Piper, W. N., and Helwig, E. B.: Progressive systemic sclerosis: Visceral manifestations in generalized scleroderma. A.M.A. Arch. Dermat., 72: 535-546 (Dec.) 1955.
6. Salomon, A., Appel, B., Dougherty, E. F., Herschfus, J. A. and Segal, M. S.: Scleroderma: Pulmonary and skin studies before and after treatment with cortisone. A.M.A. Arch. Int. Med., 95:103-111, 1955.
7. Spain, D. M. and Thomas, A G.: Pulmonary manifestations of scleroderma: Anatomic-physiologic correlation. Ann. Int. Med., 32:152-161 (Jan.) 1950.
8. Windesheim, J. H. and Parkin, T. W.: Electrocardiograms of ninety patients with acrosclerosis and progressive diffuse sclerosis (scleroderma). Circulation, 16:953 (Nov.) 1957.
9. Klein, Rubin and Harris, S. B.: Treatment of scleroderma, sclerodactylia and calcinosis by chelation (EDTA). Am. J. Med., 19:798-807 (Nov. 1) 1955.
10. Muller, S. A., Brunsting, L. A. and Winkelmann, R. K.: Treatment of scleroderma by chelation (EDTA). (In press.)
11. Casten, G. G. and Boucek, R. J.: Use of relaxin in the treatment of scleroderma. J.A.M.A., 166: 319-324 (Jan. 25) 1958.
12. Olsen, A. M., O'Leary, P. A., and Kirklin, B. R.: Esophageal lesions associated with acrosclerosis and scleroderma. Arch. Int. Med., 76:189:200 (Oct.) 1945.
13. Creamer, Brian, Andersen, H. A. and Code, C. F.: Esophageal motility in patients with scleroderma and related diseases. Gastroenterologia, 86:763-775, 1956.
14. Kierland, R. R. and Hines, E. A., Jr.: Cortisone and corticotropin (ACTH) in treatment of scleroderma. A.M.A. Arch. Dermat. & Syph., 64:549-554 (Nov.) 1951.
15. Hines, E. A., Jr., Wakim, K. G., Roth, G. M. and Kierland, R. R.: The effect of cortisone and adrenocorticotrophic hormone (ACTH) on the peripheral circulation and blood pressure in scleroderma. (Abstr.) J. Lab. & Clin. Med., 36:834 (Nov.) 1950.

Rearmament Not Disarmament

DAVID B. ALLMAN, M.D.
Atlantic City, New Jersey

One international field in which national barriers are conspicuous by their absence and in which agreement exists about the need for rearming with more men and materials is medicine. While we continue to increase and strengthen our world-wide medical armamentarium, we must also strengthen our local medical and *medico-social* armamentaria.

IT IS NOT uncommon for the eyes of medicine to be upon Minnesota and its physicians. For example,

—You are nearing the end of one of the finest state medical meetings I have had the privilege of attending.

—Tomorrow the city of Minneapolis dedicates its new Public Health Center, and I am most happy that I can be present at the ceremonies.

—Next week the World Health Organization opens its Assembly meeting here, and again I am pleased that I can be here for the special tenth anniversary commemorative session of WHO on Monday and Tuesday.

—Then, of course, it is a pleasure to visit Minnesota during your Centennial celebration and to help you re-emphasize the great role medicine has played in the development and growth of this state.

My visit here also allows me to extend to every Minnesota physician a personal invitation to attend the American Medical Association's clinical session here in Minneapolis beginning December 2 and running through December 5 this year.

I particularly want to commend, in advance, the excellent work being done by Dr. O. L. Norman Nelson, general chairman of arrangements for the 1958 clinical session here, and Dr. N. L. Gault, Jr., local chairman of the scientific program. These two gentlemen, I know, are determined to stage the finest AMA clinical session in history, and with your co-operation I have no doubt that they will succeed.

Delivered at the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, May 23, 1958.

Dr. Allman presented this address as President of the American Medical Association.

The AMA session here will be the fifth time the Association has convened in Minnesota. In 1882 and 1901 it met in St. Paul and in 1913 and 1928 in Minneapolis.

Minnesota has always been active in AMA affairs. For example, you have contributed three Presidents—William J. Mayo, Charles W. Mayo, and E. Starr Judd.

And today you have many members in key AMA positions. Ordinarily, when I am at a state meeting, I like to pay tribute to the men and women serving the AMA in various capacities. However, Minnesota has so many physicians on AMA councils and in the House of Delegates that it probably would take at least ten minutes to mention them all.

Nevertheless, let me express my sincere thanks to Minnesota for allowing the AMA to share with you the great talents of these men.

I could continue in this same vein for hours, pointing out the excellent medical contributions of your fine medical school, clinics and hospitals. But you know as well as I do that outstanding medicine is no rarity in America; it is being practiced in New Jersey and the East, the South, the rest of the Midwest and the Far West.

In fact, we know that medicine and good medical work does not belong solely to one state, one region or even one particular country of the world. They are cosmopolitan—they belong to all the world and are at home in any country.

Language, race, money and even government are not insurmountable barriers to good medicine and medical doctors. Medicine itself is a universal language because its procedures—new and old—generally can be equally valuable on every continent.

Medicine is a worldwide profession of mercy, comforting the sick and injured regardless of nationality, creed or color of skin.

Medicine is not a self-seeking profession because the medical benefits to mankind come first before recompense and cost. And even though money sometimes is required to provide facilities, equipment and supplies, unbelievable medical accomplishments have been carried out in many of the most poverty-stricken areas of the world.

Yes, even in communistic and socialistic states medical men strive to benefit the patient despite government intervention, red tape and all the evils of state medicine. Even a government-directed

doctor seeks to improve health and relieve sickness through his medical science, and to ease fear through his art of medicine.

So, I am firmly convinced that medical science is man's true glory, and through its full use around the world we can do more for man's true happiness—peace—than all the gifts and loans of money, and all the demonstrations of military might.

What's more, in medical science there is no Cold War between East and West. We need not go to the summit to seek international inspection systems, for medicine has no secrets. In fact, physicians of the world share their information and are dedicated to the free exchange of all discoveries and new techniques and developments.

Medicine also does not seek a general reduction of physician forces around the world, but rather it favors and promotes *rearmament* of its forces. We seek an adequate medical arsenal of trained and skilled manpower, and all the necessary drugs and instruments to combat and destroy man's greatest enemy—disease.

For example, medical science's tests to develop new atomic techniques will continue—not on the Nevada wastelands or the isolated waters of the Pacific, but in the laboratories of our nation and the world. The objective will not be "clean" bombs or "dirty" bombs to kill man, but *rays* and *ways* to kill the disease that destroys human beings.

All our medical ammunition, however, will be intercontinental in variety, because our war against the fevers of mankind is not limited to one nation or one ideaology. Our aim is the destruction of all mankind's cripplers and killers.

Yes, medicine must be in the *vanguard,* and all our weapons must be ready to intercept the enemy —disease—whenever and wherever it strikes.

We cannot rely solely on "wonder" weapons, either. We need a great corps of men and women to maintain the good health of all peoples and to wage continued war on the outbreaks of disease and injury in all places of the world.

We need more men and women of conscience who constantly seek to do the *right* thing in a *just* way for all human beings, and who are willing to fight mankind's greatest foe day and night.

Thus, the call to medicine around the world must not be *disarmament,* but *rearmament,* for we must bolster our defenses and our offenses with conscientious men and a great armamentarium to assure our nation and the world of less killing by disease and more living because of good medicine.

Here at home we in the medical profession also need to *rearm* ourselves for the growing struggle to keep "medical merchandisers" out of the business of both patient and physician.

Isn't it *disturbing* to you that American doctors are forced to defend this nation's competitive free enterprise system of medical practice—a system that has brought our fellow citizens the highest standards of medical care the world has ever known?

Isn't it disquieting to hear certain medical merchandisers, particularly government, scoff at medicine's achievements, high intentions and good character?

And isn't it *discouraging* to see these outsiders gnawing their way into the field of medicine, medical practice and the doctor-patient relationship, and actually controlling and directing the destinies of physicians and patients?

Disheartening as the situation may be for the free enterprise system and private practice of medicine, the profession and all freedom-loving Americans must not lay down their arms and surrender to government domination or outside dictation.

We in the profession recall with a good deal of pride our successful efforts to fight other legislative attempts in past years to curtail precious freedoms and to bring mediocre medicine to all and good medicine to none.

We remember the great number of allies who came to our support when these groups realized the creeping effects government control of one segment of American life would have on all other segments.

The outlook for our profession and the entire free enterprise system was quite dark less than a decade ago. But a *united effort* returned this nation to sane reasoning. The situation is no less dark now, but again a concerted drive can stop big government from managing the lives of every American.

The doctor who does not think the struggle for the ideals of freedom, personal responsibility, and individual initiative is necessary or worthwhile must be blind, deaf, or both to the dangers.

I realize that it is easy to become preoccupied with our own affairs, to be somewhat unaware of the threats, and to take the easy road of surrendering our responsibilities to others. But let's decide right now that we as physicians will speak up for

freedom and will act in behalf of democracy and the private competitive free enterprise system.

Let's not put ourselves in the position of having to ask ourselves in years to come:

"Where was I and what was I doing when my country and my profession lost their freedom?"

Unfortunately, there has been wide acceptance by legislators and the public of government's role in medical and health affairs. This is because government intrusion into medical services has been labeled "beneficient."

Now, for example, under the guise of social welfare, proposed legislation would provide government-supervised hospitalization and nursing home care for the nation's 15 million persons eligible for Social Security benefits. Without question the proposal has rich political appeal. But without a doubt it offers less than the best medicine.

Making our aged subservient to government with health-care handouts is not the solution to this problem. The solutions lie elsewhere and a vast movement is currently underway to attack the problem with intelligence, enlightened understanding and personal concern.

Some of the most important and respected organizations in the health field are preparing a program which will lead toward a solution of the problem of adequate health care and better health for the aged. These organizations—the American Dental Association, American Hospital Association, American Medical Association, and American Nursing Home Association—have formed the Joint Council to Improve the Health Care of the Aged.

The Joint Council is working in three broad areas, aimed at: (1) reducing the cost of rehabilitation, (2) providing less costly facilities for the aged who are ill, and (3) seeking more widespread coverage of retired workers through the voluntary health insurance industry, which in a few short years has done a phenomenal job of covering some 40 per cent of those over sixty-five years of age.

Basically, this problem of the health care of the aged calls for aggressive leadership of the type you people are equipped to provide, at the community level. Again it will take the *rearming* of our medical forces to get this job done.

For the aged who are chronically ill, we need to look into the establishment of home nursing and home care services, such as have already, in a number of communities, reduced by as much as 60 per cent the need of the community's elderly for hospitalization.

For those who are without adequate means to afford proper health care in acute illness or serious injury, we need to look into the means whereby the state and local welfare departments pay for such emergencies; in many areas, state aid to the indigent is woefully inadequate, and needlessly so.

It is voluntary community leadership that has kept this a vigorous nation. And it is such leadership, now, utilizing to the full our voluntary service agencies and the proven strength of free American institutions, that will bring new hope for our aged before they are legislated into a permanent state of dependency!

Let's make another point clear right now. Everyone of our senior citizens is an extremely important individual. He or she is not just an old man or an old woman. The over-sixty-five person is a distinct personality with hopes, dreams and aspirations just like anyone forty years younger.

Therefore, I am opposed to any federalized system of medical care and hospitalization that would lump these individuals into a mass and reduce them to numbers and nonentities.

We in medicine know the need to treat patients of all ages as important individuals. We see the urgency of strengthening the democratic spirit and the private competitive free enterprise system. We realize the necessity of opposing opportunism that moves too many persons *to get* rather than *to give,* to prefer soft security to militant freedom, and to want the laxness of personal irresponsibility.

Gentlemen, I say to you that if we, and all Americans, do not follow our ideals and fight for them, we soon shall find Big Government sitting squarely in our laps, heavy enough to reduce you and me and every American—young and old—to manageable size.

Only a strengthening of our forces—a rearming if you wish to call it that—will keep government off our backs and will prevent the overthrow of the private, competitive system of medical practice that has placed American medicine in the world spotlight of achievement and advancement and made American medical care the model for all to emulate.

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[1]Sadove, Max S. and Schwartz, Lester: An Evaluation of Buffered Versus Nonbuffered Acetylsalicylic Acid, Postgraduate Medicine; 24:183, August, 1958.

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Public Health in Minnesota

An Overview of the Past and a Glance Toward the Future

Dr. Diehl is Senior Vice President for Research and Medical Affairs and Deputy Executive Vice President, American Cancer Society, Inc., New York, N. Y.

The Albert J. Chesley Memorial Lecture of the Minnesota Public Health Conference, Saint Paul, Minnesota, September 18, 1958.

HAROLD S. DIEHL, M.D.
New York, New York

IT is a great honor at any time to be invited to give the Albert J. Chesley Memorial Lecture but to have this privilege during Minnesota centennial year is quite overwhelming. As a matter of fact, when I received the invitation from your program chairman, I replied immediately that I would be pleased and honored to accept but that I doubted my ability to do justice to the occasion.

In this regard, I am much like the man in a small town who was noted far and wide for his forceful and picturesque profanity. On this particular occasion, he was hauling a wagon load of apples to a cider mill in the country. This involved fording a small stream which he did without difficulty but as he was driving up the bank on the far side, the tail-gate of the wagon came open and the apples rolled out and floated downstream. A neighbor seeing this happen, watched in anticipation of a real treat. He was amazed, however, when the driver just got out, stood with his arms akimbo and shook his head as the apples floated away. In disappointment his neighbor called to him and said: "What's the matter? Have you lost your tongue?" "No," he replied, "I just don't feel equal to the occasion."

That is very much the way I feel this evening; but Dr. Chesley and the State of Minnesota both mean so much to me that I will try to share with you some thoughts I have concerning them both in connection with this centennial program. First of all, I would point out that it is most appropriate to speak especially of Dr. Chesley during this centennial year, because he served the State of Minnesota over more than half of the century covered by this centennial celebration.

A hundred years is but a brief moment in the history of the world or even of mankind, but in terms of progress in the prevention and cure of disease, more has been accomplished during this one century than during the millions of years which went before.

This is 1958. In 1858, Minnesota was still a frontier state with a population, exclusive of an unknown number of Indians, of about 170,000, of whom 10,000 lived in Saint Paul; 2,300 in Stillwater; 3,200 in St. Anthony; 2,500 in Minneapolis and 70 in Duluth. The southern part of the state contained a number of villages such as St. Peter, Mankato, Le Sueur and Rochester, but the great areas of the northern and western portions of the state were prairies and forests, the hunting and fishing grounds of Indians and fur traders. Roads were few and travel to the state was primarily by river steamer up the Mississippi.

Minnesota had been advertised in New England as a land of unequalled sunshine and healthful climate, with dry, pure air which gave relief and strength to sufferers from many diseases, but particularly tuberculosis and other diseases of the respiratory tract. One enthusiast wrote, "There has not been one case of sickness in the whole of

Hennepin County for several weeks past. What do you think of that, you who are shaking yourselves to pieces with ague?"

Unfortunately, the records do not confirm these optimistic reports. Living conditions were primitive and sanitation practically non-existent. People suffered greatly from the cold and from malnutrition. Respiratory and intestinal diseases were commonplace, with epidemics of diphtheria, scarlet fever and smallpox frequently taking terrific tolls. Infant mortality was so high that parents of newborn babies merely hoped that their children would survive the hazards of infancy and childhood.

Doctors came into the territory with other settlers but many of them had had little formal or systematic medical training, and some who called themselves "doctor" and cared for the sick had had no medical training whatsoever. Among this group there were, however, two notable exceptions: one, William Worrall Mayo; the other, Charles Nathaniel Hewitt. We will have more to say concerning both of these remarkable men later; but first let us take a look at the status of health and medical care generally at this time.

Almost unbelieveable is the fact that a century ago, the basic concept of micro-organisms as a cause of disease had not been established. The effectiveness of Jenner's vaccine against smallpox had been demonstrated beyond question, and where available and utilized, it provided high grade protection against this disease.

In speaking of Jenner's vaccine, I would digress to explain to those of you who know smallpox vaccination as it is practiced today that in those days, and in fact when I was first vaccinated as a boy, the vaccine most commonly used was made from the macerated crust or scab from someone else's vaccination. When these crusts or scabs from a successful vaccination reached the stage at which they could be removed, physicians carefully preserved them as a source of vaccine for others. Such vaccine material contained not only the virus of cowpox but also various types of pyogenic organisms. The result was that all such vaccinations were infected, in many instances, so badly infected as to produce serious illness and deep vaccination scars that persisted for life.

The studies of Louis Pasteur in France and Robert Koch in Germany, demonstrating beyond doubt that micro-organisms cause disease, and providing the foundation upon which communicable disease control has been developed, were first published in 1876, approximately eighteen years after Minnesota had been granted the status of statehood. Yet more than thirty years earlier, Oliver Wendell Holmes had insisted that childbed fever was an infectious disease carried from one patient to another by the hands of the physician or midwife. A few years later, Semmelweiss in Vienna noted that the death rate from puerperal sepsis was several times as high in the ward of the hospital to which students and physicians came from the dissecting room as it was in other wards of the same hospital. He therefore issued orders that patients were not to be examined by persons coming directly from dissecting rooms. This precaution reduced the mortality from puerperal sepsis from 12 per cent to 3 per cent, and later to approximately 1 per cent.

In surgical operations, a hundred years ago it was accepted that all operative wounds would be infected. In fact, Lord Lister's work which introduced antisepsis into surgical procedures was not begun until 1860 when he was appointed Regius Professor of Systematic Surgery at Glasgow.

The discovery of the causes of tuberculosis, of diphtheria, of typhoid fever, of cholera and other serious epidemic diseases came later. In 1854, cholera, which has been unknown in this country for more than fifty years, killed more than 2,000 people in Chicago in a period of six weeks. In 1866 there was a sizable outbreak of cholera in the Mississippi Valley, and in 1868 the captain of a river boat deposited cholera victims on the levee at Red Wing. The first hospital in Minnesota territory was built in Saint Paul by the Sisters of St. Joseph and was located on the present site of St. Joseph's Hospital. While this hospital was under construction, a cholera epidemic forced the Sisters to open an emergency hospital in Father Galtier's Chapel in Saint Paul. During these early years, malaria prevailed throughout the Mississippi Valley and frequently reached into Minnesota. Yellow fever also occurred from time to time along the Gulf and Atlantic coasts, spreading panic among the population of the cities which it struck. Epidemics of smallpox were frequent and numbered their victims by the thousands.

One could continue at great length with this picture of the conditions of health and of medical knowledge a hundred years ago, but we must get on to the subject of the evening.

An adequate record of the development of public health work in Minnesota over the past century would require volumes and would include the names of hundreds of individuals who have made significant contributions at state and local levels in both voluntary and official health agencies. Anything approaching a complete report of this is obviously impossible in the short time available to me this evening. I have therefore decided to limit my remarks to brief descriptions of a few individuals who made most distinguished contributions to public health on a statewide basis.

Early in my comments, I mentioned the coming to Minnesota in 1854 of Dr. William Worrall Mayo. Not only was Dr. Mayo a pioneer citizen who contributed substantially to the organization and development of the State of Minnesota, including the State Board of Health of which he became a member, but even more important, he gave to Minnesota, the nation and indeed the world, two sons, William J. and Charles H. Mayo, whose names have long been synonymous with the most progressive and highest quality of medical practice. A century ago, no one would have believed it possible that a world-famous center of medical practice, graduate medical education and medical research could be developed at what was then a mere crossroads in southern Minnesota.

Although known primarily as distinguished surgeons and organizers of the renowned Mayo Clinic, both Dr. Will and Dr. Charlie made great contributions to the improvement of the public health. Doubtless the greatest area of this contribution was and continues to be the high standards of medical practice set by the Mayo Clinic, the distinguished research achievements of the Mayo Foundation, and the splendid advanced education and training in clinical medicine given to thousands of physicians by this same institution.

In addition, Dr. Will made a lasting contribution to better health in Minnesota by his support of a strong medical school at the University throughout his thirty-five years of membership on the Board of Regents of the University. Dr. Charlie's service to public health was more direct, in that he served both as health officer of Rochester and as a leader in various statewide health agencies. In both positions, he was a tower of strength for progress in public health—an interest which he maintained until his dying day. So to the Doctors Mayo—the father, William Worrall, and the sons, Dr. Will and Dr. Charlie, we must give great credit for the high quality of both medical and public health services which we enjoy in Minnesota today.

The other distinguished pioneer to whom I referred, was Dr. Charles N. Hewitt. Dr. Hewitt, a well-educated gentleman and a well-qualified physician, came west to Minnesota from New York State after the Civil War, in which he had served as a medical officer with the 50th New York Engineers. Concerning his military service, General Letterman, General Hookers' chief medical officer, said: "He is the best regimental surgeon in the Army of the Potomac."

Upon arriving, Dr. Hewitt settled in Red Wing and devoted himself to the private practice of medicine. However, his training in medicine and in sanitation, and his experience in the Army made him concerned about the lack of an organized public health program in the state. He had read of the establishment of a health department in Massachusetts in 1869, and of a similar action by California two years later. He therefore drafted a bill, modeled after the Massachusetts Act, authorizing a State Board of Health for Minnesota. This bill was supported by the State Medical Society and passed by the Legislature on March 4, 1872, making Minnesota the third state to recognize the health of its citizens as a direct concern of the state government.

Previous legislation authorized various cities, towns and villages to enact ordinances for the control of contagious diseases and the abatement of nuisances. In 1866, the Legislature authorized the township supervisors to become the board of health in the township, a law which, except for minor changes, exists today—ill-adapted though it is to modern health administrative responsibilities.

The law establishing the State Board of Health provided for six physicians appointed by the governor to serve without pay and one as executive secretary at an annual salary of $200. The appropriation to support the work of this board was $500 annually. The first meeting of the Board was held on March 26, 1872, at the time of

a smallpox epidemic in the state in which there were over a thousand cases and about 250 deaths among a total population of 450,000. Diphtheria, scarlet fever and typhoid fever were widespread. The Board of Health, with almost no funds and little public interest, was thus immediately faced with a tremendous task. Dr. A. B. Stuart of Winona was chosen as the first President of this board and Dr. Hewitt was elected Secretary and Executive Officer.

Dr. Hewitt's amazing vision is illustrated by his first report to the Board of Health, in which he stated that, "Disease germs as grains of wheat, must not only be active themselves, but they must find a soil suitable to their development. We deal with disease, therefore, in two ways, first by searching out and destroying the germ, and, second, by preventing the human body, habitations, and so forth, from becoming fit soil for the growth of the germ." This statement was prophetic because it was made several years before the publication of Pasteur's work which demonstrated that micro-organisms are definitely the causative agents of certain communicable diseases.

As a result of Dr. Hewitt's efforts, the Legislature in 1883 passed an act authorizing the State Board of Health to make regulations having the effect of law for the control of communicable diseases. This still maintains and has been of tremendous value over the years in the reduction of communicable diseases in Minnesota.

In 1874, Dr. Hewitt was appointed Professor of Public Health at the University and in 1877 the Regents, upon Dr. Hewitt's recommendation, ruled that every student should have a physical examination upon entrance to the University and annually thereafter. Dr. Hewitt himself conducted many of these examinations and also delivered lectures in public health at the University over a period of twenty-seven years. Both of these activities were truly pioneering, not only in Minnesota but throughout the nation. It is significant also that they formed the basis for the close and effective relationship that has existed ever since between the State Board of Health and the University.

In addition to his administrative and educational activities and responsibilities, Dr. Hewitt continued his interest and his work in the scientific aspects of public health work. In 1890, when his salary was $1,000 per year, at his own expense he spent six weeks in London studying methods of smallpox vaccine production and diphtheria control, and six weeks in Paris becoming acquainted with Pasteur's work in bacteriology and the treatment of rabies.

Returning to Red Wing, he established the first public health laboratories west of the Alleghenies. These laboratories were transferred to a building on the campus of the University in 1893. Also in 1890, having been unable to obtain an adequate supply of smallpox vaccine, Dr. Hewitt began the production of vaccine at his home in Red Wing. This he supplied at cost to health officers and physicians and to the U.S. Army in what was called the Department of Dakota.

In 1895, Dr. Frank Wesbrook, a native of Manitoba, who had had excellent training in bateriology and pathology in England and Germany, was appointed Professor of Bacteriology and Public Health in the Medical School of the University. A little more than a year later, Dr. Hewitt placed the laboratories of the State Board of Health under Dr. Wesbrook's direction. This was followed by the provision of laboratory services for the physicians of the state for the examination of throat cultures for diphtheria bacilli and for Widal tests for typhoid fever. The morphological classification of diphtheria bacilli developed in these laboratories was widely adopted by public health laboratories in this country and in Europe.

In 1897, political considerations led to the termination of Dr. Hewitt's appointment as Secretary and Executive Officer of the Board. He was at this time sixty-one years of age. In his final report to the Board, Dr. Hewitt said, "The best years of my life and effort have gone into this work. I have spared neither time, labor nor thought to make it what it ought to be. Such as it is, the record is made and closed. I resume tomorrow the active practice of my profession with the sincere wish that the public health service of Minnesota may retain and advance the position it has won among similar organizations in other states. I am still anxious that it continue to serve the whole people of Minnesota in the future as in the past." With these words, Dr. Hewitt ended twenty-five years of distinguished leadership and service in public health and Minnesota lost a most extraordinary and devoted public servant.

Successor to Dr. Hewitt as Secretary and

Executive Officer of the State Board of Health was Dr. Henry M. Bracken. Born in Pennsylvania and raised in Ohio where his father practiced medicine, Dr. Bracken started his medical education at the University of Michigan and completed it at the College of Physicians of Columbia University. After graduation from Medical School, Dr. Bracken had a most active and varied career. He first served as surgeon to a mining company in Venezuela; then did graduate work in public health in Edinburgh; served as physician to a boys' school in England; spent three years as doctor for several ships that cruised the Caribbean and South American waters; devoted two years to private medical practice in New England; went to Mexico as a mining camp doctor; returned to New York for further postgraduate study; and in 1885 came to Minnesota and opened an office for the practice of medicine in Minneapolis. In 1887 he was appointed Professor of Materia Medica and Therapeutics in the Medical School. Ten years later he became Secretary and Executive Officer of the State Board of Health.

Dr. Bracken had unusual vision and a strong and forceful character but was reported to have been at times "notably lacking in tact." He built upon the sound foundation laid by Dr. Hewitt, added able members to the staff, and in his twenty-two years of service as Secretary and Executive Officer, substantially expanded and strengthened the work of the State Health Department. In addition, he was one of the organizers of the National Tuberculosis Association, and served both as president and as secretary of the Conference of State and Provincial Health Officers of North America.

Upon Dr. Bracken's resignation in 1919, Dr. Charles E. Smith, Assistant Secretary of the Board, was appointed Secretary and Executive Officer. His tenure in this office, however, was very brief, being terminated by death only two years after his appointment. His successor, appointed in 1921, was Albert J. Chesley, whom this lectureship memorializes and honors.

Dr. Chesley served as Secretary and Executive Officer of the Board from 1921 until his death in 1955, a record tenure of thirty-four years. Long as this is, however, it is twenty years short of Dr. Chesley's complete period of service with the State Board of Health for he started working for the Board as a clerk in 1901 and continued as a part-time laboratory assistant during his years in medical school.

After he completed his medical training he joined the staff of the Board of Health on a full-time basis. His first appointment was as assistant bacteriologist and epidemiologist, but very soon thereafter he was placed in charge of the Division of Epidemiology, a position which he held until his appointment as Secretary and Executive Officer in 1921.

There was only one interruption during Dr. Chesley's forty-eight years of full-time service with the State Board of Health. That was during World War I when, unable to get into the Army, he went to France and later to Poland with the American Red Cross. It was in this latter assignment that I was first privileged to become acquainted with this superb gentleman, friend and public servant.

After the Armistice in November, 1918, Paderewski, President of the New Poland which was reunited after 130 years of partition and domination by Russia, Germany and Austria, requested assistance from the American Red Cross in dealing with the disease, destitution and even starvation of the people of his country which had served as a battleground during four years of war and had endured the repeated passage back and forth of hostile armies. Dr. Chesley immediately volunteered for this service and was given the responsibility of recruiting a staff. Having heard that our University of Minnesota Base Hospital No. 26 was awaiting orders to return to the States, he inquired as to whether any of the group would be interested in joining the mission to Poland. Four of us, all recently graduated from medical school, volunteered and were accepted for this assignment, which proved to be one of the most interesting experiences of our lives.

In the spring of 1919, after obtaining our discharges from the Army and receiving commissions in the American Red Cross, we traveled from Paris to Warsaw on a special train carrying both personnel and supplies. On this same train was the director of laboratories, a woman physician, who went to Poland as Dr. Placida Gardner and returned as Mrs. Chesley. Dr. Chesley had gone to Warsaw ahead of us to make plans and arrangements for our arrival. He was then Chief of Staff and Deputy Commissioner but very soon thereafter was appointed American Red Cross

Commissioner to Poland, in complete charge of the development and operation of the mission.

The medical and health problems of Poland at this time were colossal. Typhus fever, tuberculosis, malaria, dysentery and typhoid fever were everywhere. In 1919 it was estimated that 2,000,000 children in Poland were urgently in need of medical care, of whom 750,000 were orphans; also that 10,000 children died in that one year in Warsaw alone, mostly from tuberculosis. Medical facilities were almost non-existent and medical personnel exceedingly scarce; one physician to 8,000 people overall and one to 15,000 in many areas. And of these physicians, some 400 died from typhus in 1919.

In spite of what appeared to be overwhelming difficulties, Dr. Chesley quietly, patiently and efficiently proceeded to build a large and effective organization. Working with him day and night in offices, in laboratories, and on long trips by train and by automobile to investigate conditions throughout the country, I learned to admire, respect and love this quiet, dedicated and self-effacing man.

Returning to this country in the fall of 1920, Dr. Chesley resumed his position as Director of the Division of Communicable Diseases of the Minnesota Department of Health. Within a year, however, following Dr. Smith's death, Dr. Chesley was appointed Secretary and Executive Officer of the Board. His achievements during the thirty-four years that he held this post are too numerous even to list. However, the almost complete elimination of diphtheria and typhoid fever, the enormous reduction in tuberculosis, as well as in infant and maternal mortality are tangible evidence of his achievements.

Under his administration, the Department of Health greatly expanded its activities, but this was done most conservatively because Dr. Chesley believed that the expenditure of public money is a public trust. I doubt that any state ever received more in public service for the money expended than Minnesota did under Dr. Chesley's administration.

Two of his fundamental concepts for effective public health work were to work co-operatively with the medical profession and with the University and its medical school. Both of these he practiced continuously. As a result he was always able to obtain the support of the State Medical Association for the public health measures which he advocated, and we of the University and its medical school could always count upon his co-operation and support in our efforts to develop educational programs in the field of health for the profession and for the public. In fact he, more than any other one individual, was responsible for the establishment of our now distinguished School of Public Health.

In a recent address, Dr. Gunnar Gunderson, president-elect of the American Medical Association, said:

> "The wise public health physician knows he must lay aside the cloak of authority if he wants to lead. Instead of issuing orders under the law, he endeavors to persuade in order to be an accepted, not an authoritarian, leader." (It Takes Two . . . *J.A.M.A.*, Vol. 166, No. 10, Mar. 8, 1958)

This is the method Dr. Chesley always used. Expressing himself frequently in parables and with a subtle humor, Dr. Chesley carried out most of his administration by suggestion rather than by direction. By this technique he not only obtained cooperation but he encouraged and inspired others to do their best and in so doing, influenced many able young men to devote themselves to careers in public health service. Many of these have attained positions of national leadership. As a matter of fact, some years ago in presenting one of these men to the American Public Health Association as its new president, Dr. Hugh Leavell, Professor of Public Health Administration at Harvard University, said:

> "Dr. Shepard had his professional education in Minnesota, a state that has produced as many leaders in public health for this country as Scotland has for Britain."

On the national scene also, Dr. Chesley was a leader, serving as President of the American Public Health Association, as President and as Secretary-Treasurer of the Conference of State and Provincial Health Officers, as well as in many other prominent and responsible positions. Honors and distinctions, however, meant nothing to him, his only satisfactions coming from doing well the jobs that he believed to be worthwhile.

Over the years, Dr. Chesley had many strong supporters in his work but among these I am sure that he would want me to mention especially Dr. S. Marx White. After graduation from Northwestern University Medical School, Dr.

White decided that Minneapolis was the place that he wanted to live. He turned to internal medicine in which he has had a most distinguished career, serving as Head of the Department of Medicine in our Medical School, and as the President of the American College of Physicians. In spite of his devotion to medicine, Dr. White has given outstanding leadership in the field of public health, including service for many years as a member and as President of the State Board of Health. In this, as well as in other capacities, his friendship, counsel and support were invaluable to Dr. Chesley, in his work, as it has been to me in mine. All of this, Dr. Chesley and I would wish to acknowledge on such an occasion as this.

I mentioned earlier that I traveled from Paris to Warsaw on a train with Dr. Placida Gardner who returned from Poland as Mrs. Chesley.

Their courtship, as you can well imagine, was carried out under very real difficulties. The head of a mission in a foreign country is never "on his own." With his usual resourcefulness, however, Dr. Chesley managed it all so adroitly that their wedding in Warsaw, which I was privileged to attend, came as a complete surprise to almost everyone in the organization. Up to that time, everyone had thought Dr. Chesley a confirmed bachelor. Fortunately, however, for him as well as for all of us who have had Dr. and Mrs. Chesley as intimate and valued friends, Placida proved this idea incorrect. I say "fortunately" because Dr. Chesley could not possibly have had a more understanding and helpful partner throughout his many years as head of our State Department of Health. Much of the credit for his achievements, I am sure, belongs to her. So, Placida, this evening we are honoring and paying tribute to you as well as to him.

And now for a brief glimpse toward the future of public health in Minnesota. When Dr. Chesley was appointed Executive Officer of the State Department of Health, the leading causes of death in Minnesota were pneumonia and influenza, heart disease, cancer and tuberculosis. At the time of his death, the corresponding list consisted of heart disease, cancer, vascular lesions of the central nervous system and accidents.

This change in the "Captains of the Men of Death" suggests the changes of emphasis in public health programs which must be made to adequately meet the public health needs of the future. I say "changes in emphasis" because the measures which have resulted in the control of the serious communicable diseases must not be relaxed. Tuberculosis infection is still widespread and a major cause of illness and disability during early adult years. Even smallpox can become a serious hazard if vaccination is neglected. Grim evidence of this was the epidemic of malignant smallpox in Minnesota in the winter of 1924-25, when there were approximately 1,000 cases and 300 deaths in Minneapolis alone. Diphtheria could again assume epidemic proportions if immunization is neglected. The same is true of typhoid fever and other diseases of the gastrointestinal tract if the sanitary measures which have been so effective in virtually eliminating them are relaxed.

On the other hand, different types of programs are required to deal with heart disease, cancer, accidents, mental illnesses, arthritis, and the other major causes of death and disability today. Dr. Chesley anticipated these changes and adapted the State Health Department programs to meet them.

As I mentioned earlier, two of Dr. Chesley's basic precepts in public health work were effective co-operation with the medical profession and instruction of the public concerning the responsibilities that individuals must assume for their own health and for the health of their families and their communities. These are the types of approach upon which we must primarily depend for progress against the major public health problems of today and of the future.

This being true, we can be assured that as a result of Dr. Chesley's unusual vision and the splendid and devoted staff that he recruited for the State Department of Health, the future of public health in Minnesota will be as bright as the distinguished record of the past.

In conclusion, I would repeat that progress in public health over the century just concluded has far exceeded what even a scientific dreamer could possibly have envisioned a hundred years ago, and that since the establishment of its State Board of Health, Minnesota has been in the forefront of this progress both in this country and abroad.

As to Dr. Chesley's part in all of this, I would quote the inscription which I saw recently above the tomb in St. Paul's Cathedral in London of Sir Christopher Wren, its architect. This inscription reads: *"Si monumentum requiris, circumspice"*—which translated means: "If you would see his monument, look about you."

Medicine: Some Prospects, Challenges, and Opportunities

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THE eminent British historian Arnold Toynbee has described the known civilizations of the world in terms of challenge and response. Those civilizations rising to the greatest heights, those marked by the most significant social, political, esthetic, and technological accomplishments are those which, in Toynbee's view, received the stimulus of a challenge of optimum severity. Those civilizations confronted by challenges too severe, such as an Arctic environment, failed to flourish, since mere survival under such circumstances requires all the energies and talents of the populace, leaving little or none for creative activity.

The effect of a too severe challenge on a civilization could be predicted with reasonable ease. Less predictable perhaps is the opposite side of the Toynbee coin: Those civilizations called upon to meet challenges of less than optimal degree also were characterized by lack of accomplishment. In support of this aspect of his thesis, Toynbee presents numerous examples of "soft" environments failing to spawn significant, productive civilizations.

Toynbee's view of history has, of course, been questioned on many grounds, most prominent among them, perhaps, that it represents a far too sweeping generalization and simplification of a most complex matter. Time and future historians will have to confirm or deny the Toynbee thesis. That it has at least a measure of validity, however, is suggested by our own observations of human behavior, both individual and group. Certainly all of us have seen the challenge-response pattern in our friends, in members of our families, in ourselves. We have noted how frequently in human endeavors the magnitude of the effort evoked seems directly related to the intensity of the challenge presented.

It is our purpose today to examine the challenge, or more correctly, the challenges, that medicine presents to us as students, teachers, practitioners, researchers—challenges which can be translated into opportunities and future prospects. Perhaps such an examination will help us to perceive them more clearly, to act upon them, to be stimulated by them.

Those of you for whom today represents the beginning of your formal medical education are about to meet a challenge probably much greater than any you have faced to date, and it is you whom I want to address particularly, although I hope that my thoughts may have some interest for the others of you as well.

First of all, let me express the hope that you will not look upon the challenge merely in terms of "Can I pass Gross Anatomy?" or "What class rank can I attain?" Such an approach would be a short-sighted one for yourselves, an unhappy one for your patients, and a calamitous one for the future of medicine. Your real challenge during the next four years will be to seize every opportunity offered to you to expand and strengthen your knowledge of the fundamentals of medicine.

You will find that in medical school the emphasis is on *learning* rather than on *teaching*, that you will be presented with almost unlimited opportunities to *learn*, and that you must take advantage of these to the greatest extent possible if you are to fulfill the promise implicit in your being accepted into medical school.

The process of maturing will itself constitute a challenge for you. It will be assumed by the faculty that your outlook is adult, and you will be expected to assume from now on a measure of responsibility for your own education far greater than has been the case so far. In few instances will it suffice simply to know the lecture notes or to have in mind the facts presented in a given text. Rather you will be held responsible for a basic understanding of a subject surpassing factual knowledge alone. You will be held responsible, too, for a standard of personal conduct and appearance becoming a professional person. Your complete, unqualified integrity—undoubtedly

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Address delivered as the Minneapolis Medical Foundation Lecture on September 29, 1958. Dr. Howard is Dean of the University of Minnesota Medical School.

the physician's single most important and most essential characteristic—will be assumed from the outset. Most sincerely we hope we shall never have cause to question it.

You will be disappointed in many of the things you will *not* learn during your years in medical school. Knowledge in the medical sciences today is extensive and expanding at a rapid rate. To expect you to be finished physicians upon graduations would be unrealistic indeed. Our objectives instead are to give you a sound background in the basic medical sciences, something that few acquire after graduation if they failed to do so during undergraduate years, plus the most thorough knowledge possible of how one approaches a problem in clinical medicine—how information is acquired and synthesized, how a diagnosis is reached, how rational therapy is planned. No attempt will be made to assure your seeing an instance of every known disease or to have you see the "common diseases" in large numbers. To study one patient carefully under competent supervision is worth infinitely more educationally, your faculty believes, than to observe a dozen patients in haphazard fashion.

You will find, too, that we will not spend large amounts of time instructing you in minor technical procedures. Some of you will feel at a disadvantage as you compare your skills of this type with those of graduates of other schools when you begin your internships. I assure you that your good fundamental background will, in the long run, more than make up for any apparent deficiency.

As you can see, our fundamental approach to medical education is based on the concept that it is a lifelong process and that you will continue to be students throughout your professional lives. Certain things we will do our very best to give you during your four years with us; certain other things we will expect you to learn during periods of postgraduate study and training—formal, informal, or both. The M.D. degree, so keenly anticipated at this point in your lives, must ultimately be looked upon as your license to study for the next forty years.

You will find that your teachers feel very strongly their responsibility to you as students of today, but you will learn, too, that in equal measure they feel a responsibility to the student of medicine of the future. To seek new truths, to explore the unexplored, to refine and expand man's knowledge of the human mind and body in health and disease—all of these are goals to which members of your faculty aspire. These are no mere collection of high-sounding platitudes, nor do they represent duties and obligations which pre-empt faculty time that would otherwise be available for teaching, as is sometimes wrongly implied by those who fail to understand the nature of medical education. Rather these objectives constitute an *integral part* of medical education. Without the investigative activity that you will find so characteristic of your school, without this orientation toward the future—combined, of course, with thoughtful concern for the present and proper regard for the past—medicine would indeed be dull and sterile. A trade rather than a profession, it would have little appeal for the imaginative mind.

It will be your challenge to view medicine with imagination and foresight, to perceive the relation between the research you will see going on about you and the medicine you will practice following your years of formal training. Your most effective response to this challenge might well be personal participation in a research project during some phase of your formal education. Opportunities for such participation will be available to you during the coming years. Whether your ultimate goal is the practice of general medicine, specialty practice, or teaching and research, you will find participation in a research project, even if for only a brief period, a richly rewarding experience.

The challenges of medical school will, of course, pale in comparison with those you will meet after you enter practice. The responsibility for the care of a patient is awesome indeed. The knowledge that a life may depend upon your decision or action is truly sobering, an experience quite unparalleled in other human endeavor and a challenge that will bring out the best in the physician of real merit. Yours will be the challenge of putting to the best possible use the fundamental knowledge you acquired in school, of expanding that knowledge, and of blending with it your accumulated experience in such a manner as to bring maximum benefit to your patients.

I have spoken so far of challenges to you as students. Certainly I would be remiss if I failed to point out some of the parallel challenges that face us as members of your faculty. First of all, naturally, is the challenge presented by the young, inquiring minds of a group of carefully selected students such as you. We must stimulate you to

do your very best. More than teaching you, more than making you learn, we must make you *want* to learn. The extent to which we succeed in this will be the measure of our response to this challenge.

Despite our own special areas of interest, we must present to you a unified concept of the clinical approach to medicine, an approach which views the patient as a person, not as a repository for diseased organs. We must instill in you an appreciation for the spirit of inquiry, to which I referred earlier. It is our responsibility to make you see that teaching and research are so inseparably linked in a good medical school that withdrawal of support of either one would produce the ultimate withering of the other.

It is incumbent upon us to assure ourselves that the four short years you spend with us are invested in the most profitable manner possible. We must be alert to the danger inherent in following a certain procedure simply because we have "always done it that way." Tradition can be used to serve our ends, but it can also be a deadly trap. Or to change the metaphor, in listening to the voice of the past, we must accord it careful hearing but not uncritical obeisance. Our lectures, our teaching methods and materials, the curriculum itself deserve frequent review and critical scrutiny. We must not hesitate to eliminate outdated material or to revise courses when circumstances warrant. "Are we doing the best possible job of teaching?" must be a constantly recurring question for all of us.

As members of your faculty, we must strive at all times to establish and maintain the proper relationship of the student to the hospital itself and to members of the staff. In 1912, at the dedication of the Elliott wing of the University Hospitals, Dr. Charles Lyman Greene, Chief of the Medical Clinic, expressed a thought concerning this matter which has equal pertinence today. "It was manifest to us," said Dr. Greene, "as to Flexner, that the student must be a part of the institution and not simply a visitor on sufferance. We must endeavor, therefore, to bring him duly into the closest possible contact with cases and insist that he work out, under proper supervision and control, those problems which belong to the field of actual practice."

Concomitantly, we must fairly and accurately appraise the quality of the student's work. We must recognize the student of outstanding talent and do whatever we can to prepare him for his ultimate role of leadership in medicine. We must be equally alert to the student who does not measure up to our minimum standard, for here our responsibility is not only to our school, ourselves, and the student, but to the community at large, whose members might well suffer at the hands of an inept, insufficiently skilled physician.

I have spoken thus far principally of challenges. What of the prospects and opportunities? I judge that you already see them with reasonable clarity. Your prospects for "success"—however you may wish to measure or define it—are excellent. Like Pip in the Charles Dickens classic, you are people of *Great Expectations.*

Of even more importance, though, are your opportunities. In responding to the challenges outlined, you will be presented with countless opportunities. The opportunity to know and to understand at least something of the structure and function of that most wonderful of Nature's creations, the human body, is an opportunity given to relatively few. It must be respected and cherished and put to use for the benefit of those who place their trust in you.

Beyond this opportunity of knowing that which others know, of understanding that which others understand, lies the opportunity of opening a door in the house of knowledge, allowing light to fall in a room previously blanketed by the darkness of ignorance. The discovery of a truth, even a truth which appears relatively minor in its implications, brings an incomparable thrill.

The concept of service has probably been, for most or all of you, an important motivation for the study of medicine. The opportunity to serve your fellow man in a time of stress will be yours frequently. Such service reaps a rich harvest of satisfaction, of affection, and of respect.

If you can view medicine as a lifelong adventure, which you are now about to begin; if you serve it with all of your skill and ability; if you approach it with all the imaginativeness at your command; then the pleasures you will derive from it will be limitless, the satisfaction unbounded. Your life will be constantly exciting, never hum-drum; and your responsibilities, though heavy, will never be burdensome.

The challenges, the prospects, the opportunities are all yours. Respond to the challenges; rejoice at the prospects; and make the most of the opportunities!

Fractures in Children

General Principles

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CHILDREN'S FRACTURES are interesting because they are different from adult fractures. Growth alters the picture in children's fractures and because of the physiological factors that occur an intriguing challenge is often presented to the physician. Frequently in studying an x-ray where a bone injury has occurred, particularly in a joint, one is hard-put in deciding what type of fracture or injury the child has sustained. The differential diagnosis in children frequently is much more important than in adults. Various things such as rarefaction produced by blood vessels, congenital fractures, pseudo fractures, dense growth lines, unique pathologic fractures, epiphyseal lines and other phenomena appear on the roentgenogram helping to confuse the issue. Exclusive of transportation and farm accidents, children, in certain age periods, as a general rule, sustain fractures rather relatively easily in the long bones. Adults, too, sustain fractures quite easily as they get older.

We know that under proper care fractures in children usually heal quite readily and we might become a little careless because of this fact. A fracture may terminate disastrously because of indifferent treatment, however. In treating any fracture in a child, the utmost care and diligence should be observed throughout treatment.

When first seeing a child with a possible fracture, every effort should be made to obtain an adequate history. Frequently this is well nigh impossible because of the age of the child and the lack of co-operation. Also, at times, we find that the parents or even playmates are not too helpful in this regard. As in all other conditions in medicine, every effort should be made, however, to obtain an adequate history. Then a thorough and careful examination should be carried out. X-rays should be taken routinely and if there is any question about a fracture or dislocation in a fractured extremity, a comparable x-ray of the normal side should be taken to aid in arriving at the diagnosis.

In treating a fracture every attempt should be made to obtain as anatomical a reduction as possible. However, one should remember if after this attempt has been made and the x-ray does not show anatomical reduction, that a good functional clinical result can be obtained if certain principles are followed. Alignment of the fracture fragments is the chief requirement. If a fracture of the femur has occurred, the alignment of the fracture fragments in relation to the knee joint and the hip should be as accurate as possible. Second, a fracture should not be grossly angulated or rotated. If a rotational deformity is present, it should be corrected in the early stages of treatment and should not be allowed to persist. Marked angulation should be corrected but a slight angulation frequently is compatible with a satisfactory end result. Through experience we have learned that green stick fractures near the center of a long bone, particularly in older children with forearm fractures, must be completely broken through and accurately aligned in order to prevent permanent disability.

There are three local variables which will determine the degree of spontaneous correctibility of angular deformities in long bone fractures of children. First, the age of the child will help in determining the amount of acceptable angular deformity. The nearer the fracture is to the middle of the bone and the older the child, the more accurate the reduction must be. Conversely, the nearer to the end of the bone that the fracture occurs and the younger the child, the more angulation one may accept.

Second, the distance of the fracture from the end of the bone helps determine how much angular deformity one can accept. When the angulation is in the plane of motion of a neighboring ginglymus joint, one can expect a good deal of spontaneous correction of angular deformity. Rotational deformities are permanent. Angulations that are present (other than in the plane of motion of the neighboring joints) are

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likely to persist, although they may correct somewhat.

Third, from experience we know that deformities that occur at or near the femoral neck are not corrected by molding. Coxa vara persists and is permanent unless it is corrected by a subtrochanteric osteotomy. Rotational malalignment persists except for minimal physiologic derotation in deformities at or near the femoral neck. Fractures occurring in the proximal femur tend to straighten, however, and for this reason a subtrochanteric osteotomy which is carried out for dislocated hips may have to be repeated because the osteotomy site tends to straighten—thus losing the buttressing effect against the side of the pelvis.

A fracture that has occurred with rotational deformity either externally or internally may be corrected by a rotational osteotomy. As the child gets older, molding of the alignment of the fracture occurs. If angulation at the fracture site is present over a period of months and years in a growing child molding occurs, the general alignment improves and if an x-ray is taken at a later date, it is noted that the molding process has taken place and at times one will have difficulty deciding whether or not a fracture has been present. As we all know this does not occur in adults. For some unexplained reason, a fracture usually stimulates the longitudinal growth of bone in children. This is to be borne in mind in treating fractures of children. Because of this a moderate degree of overriding is acceptable. Fracture fragments that remain side to side in good general alignment will heal without difficulty. Molding will take place over a period of several months and years.

Most fractures in children can be treated by traction or closed manipulative reduction. Conservative treatment should be the standard bearer. Certain fractures in children are operative fractures. Fractures of the neck of the femur which are comparatively rare are considered to be operative fractures. Certain fractures of the elbow joint are operative fractures as follows:

1. Fracture of capitellum with marked displacement.

2. Fracture of trochlea with marked displacement.

3. Fracture of neck of radius with marked angulation of the neck and head of the radius that cannot be reduced by closed manipulative reduction. Open reduction is then indicated. The head of the radius should never be removed in a growing child.

One has to be constantly aware that in children's fractures, possible damage to the epiphyseal line may occur. In the experience of this writer, a sliding type of injury and displacement of the epiphyseal line does not usually result in damage to the epiphysis. A longitudinal or crushing type of injury is the type of injury that is apt to cause disturbance of the epiphysis. This can occur across the entire epiphyseal line resulting in general stoppage or slowing of growth of the involved long bone. A portion of the epiphysis may be injured resulting in stoppage or slowing of the longitudinal bone growth with resulting deformity. The patient and parents should always be advised as to this possible complication. One cannot definitely give an estimate as to the time when this complication might occur. Close clinical observation and x-rays of the involved bones (including the entire bone, together with comparable x-rays of the non-involved bone taken at a distance of six feet at about six-month intervals) will give a fairly accurate estimate as to involvement of the epiphysis. If the measurements reveal that no increase in length has occurred or possibly slight increase in length has occurred, one can then feel that stoppage or slowing of the growth at the epiphysis has not occurred. If there is definite difference in measurements showing that the involved bone is shorter than the normal bone, one then has to feel that there most likely has been damage to the epiphysis. Also after a period of time has elapsed following the injury, x-rays will show if damage to one side of the epiphysis has occurred revealing that the growth line has united. The uninvolved portion of the epiphysis will still be present and if, for instance, this occurs in a knee, genu varus or genu valgus will occur—again depending upon whether the stoppage has occurred on the inner or outer sides.

After a fracture (or fractures) in a child unites, active use of the involved extremity should be encouraged. The carrying of sand bags and pails to improve motion in an elbow is to be condemned. The child is the best guide as to his progress. No attempt should be made to passively manipulate the involved extremity. This will do more damage and frequently will increase the lack of motion in the involved joints. Sometimes it will take months before normal function and motion returns.

Clinical-Pathological Conference

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of Clinical Pathologists

CASE PRESENTATION—MINNEAPOLIS VETERANS HOSPITAL

FRANK MORRELL, M.D.
HORACE ZINNEMAN, M.D.
DONALD GLEASON, M.D.

This sixty-year-old white farmer always had considered himself in good health except for "rheumatism" at the age of fifteen. His present illness began in November, 1956, with the insidious onset of weakness, headaches, drowsiness, ataxia, anorexia and a low grade fever. In December, 1956, he was hospitalized at a private hospital. There the physical examination revealed an equivocal Babinski sign on the right, marked ataxia of all four extremities, a positive Rhomberg sign, normal sensation and equal deep tendon reflexes. The right optic disc appeared slightly choked. The spinal fluid was under normal pressure, the total proteins of the fluid were 60 mg. per cent and at a second occasion, 100 mg. per cent. There were 400 white blood cells per cu. mm., glucose was 15 mg. per cent. No pellicle was found; several cultures were negative for acid-fast bacteria and serologic tests for lues were negative. X-rays of the skull were negative and the mastoids showed nothing remarkable. A chest film, intravenous pyelogram, gastrointestinal series and a cholecystogram were negative, as was a right carotid artery angiogram. A bone marrow biopsy was not remarkable. Treatment was begun with streptomycin and isoniazid and shortly thereafter the patient was discharged to his private physician. However, the patient became increasingly confused and his weakness and lethargy increased in spite of the continued antituberculous treatment.

On January 29, 1957, four weeks after the above-mentioned therapeutic regimen had been started, he was admitted to Minneapolis Veterans Administration Hospital. His temperature was 100.6° F., BP 106/62 mm. of Hg. He was drowsy, poorly oriented with a gross memory defect. There was a moderate nuchal rigidity. Both optic discs were hazy, the lung fields were clear to auscultation and percussion. The heart was not enlarged, the rhythm was regular and there was a high-pitched systolic murmur at the left sternal border. The Babinski and Oppenheim signs were positive on the left; the patient was markedly ataxic and the right biceps and patellar reflexes were increased over the left. There was a gross bilateral intention tremor, a tendency to fall to the right, but no sensory impairment was noted.

Laboratory.—Urinalysis was not remarkable at any time. The WBC was 9,450 (65 per cent polymorphonuclear), hemoglobin 14.6 gm./100 ml., sedimentation rate 46 mm./hr., Venereal Disease Research Laboratory (VDRL) and agglutination tests for Brucellae were negative, blood urea nitrogen (BUN) 13.5 mg. per cent. Fasting blood sugar (FBS) 109 mg. per cent. CO_2 25.7 mEq./l., Cl. 97 mEq./l., Na. 133.6 mEq./l., K. 4.3 mEq./l. On admission the spinal fluid was found under an opening pressure of 320 mm. and a closing pressure of 130 mm. H_2O. The total proteins were 156 mg. per cent, sugar 22 mg. per cent, Cl. 118 mEq./l., WBC 97/cu. mm. (65 per cent PMN), cultures for acid-fast bacilli (AFB) and fungi were negative. Complement fixation tests for mumps, Western Equine and St. Louis encephalitis, as well as for lymphocytic choriomeningitis were negative. A chest film showed an infiltrate in the right upper lung field. X-rays of the skull were normal. A ventriculogram was strongly suggestive of an obstruction at the outlet of the 4th ventricle. Skin tests for histoplasmosis, coccidiomycosis, blastomycosis and tuberculosis were negative.

Hospital Course.—The therapy was continued with streptomycin and isoniazid. PAS and Pyridoxin were added to the regimen. A second spinal puncture revealed total proteins of 130 mg. per cent, sugar 5 mg. per cent, only 6 WBC's per cu. mm., all of them lymphocytes. Cultures were again negative for AFB. A concentrate of the spinal fluid failed to show fungi or tumor cells. Gastric aspirations were negative for AFB.

The patient became increasingly lethargic and confused. By February 13 he was no longer able to take oral feedings. Tube feedings were started and cortisone 100 mg. b.i.d. was added to the other medications. On February 21, 1957 the plasma CO_2 had risen to 34.2 mEq./l., the Cl. had dropped to 90 mEq./l. By February 25 these values had changed to 43.2 mEq./l. and 89 mEq./l., respectively. Serum potassium was 2.5 mEq./l. and the BUN 11 mg. per cent. The leukocyte count was 13,900 per cu. mm. (88 per cent PMN), hemogloblin 11.9 gm. per cent. Sedimentation rate was 65 mm./hr.

The cortisone was decreased to 100 mg./day and KCl added to the tube feedings. By March 1 the CO_2 had declined to 34.7 mEq./l. and the serum potassium risen to 3.3 mEq./l. The patient had been comatose since February 13. The blood pressure had been rising slowly to 200/100, and the temperature remained around 102°. On March 19, 1957 Cheyne Stokes breathing was noticed and the patient expired one day later.

Discussion

DR. MORRELL: Trying to piece this story together, we have a sixty-year-old male farmer who has never traveled outside this state and whose illness ran a total course of about four months. It began with vague central nervous system symptoms, headache, a slight fever, and alteration of consciousness. In December 1956 we have the development of an equivocal Babinski sign on the right and ataxia—two focal signs—and a

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Discussion is by Dr. Frank Morrell, Assistant Professor, Department of Neurology University of Minnesota.

The conference was moderated by Dr. Horace H. Zinneman, Assistant Professor, Department of Medicine, University of Minnesota; Department of Internal Medicine, Veterans Hospital, Minneapolis, Minnesota.

Edited by Dr. Horace H. Zinneman and Dr. Donald Gleason, Chief, Pathology Service, Veterans Hospital.

positive Rhomberg's sign as well. Sensation was normal at that time, and the optic disc was choked. We begin to see the development of focal symptoms as opposed to the generalized symptomatology presented at the onset of the disease. The spinal fluid revealed an elevated protein, 400 white cells per cu. mm., and a depressed sugar level. No pneumoencephalogram had been done, other roentgenograms were negative. The patient was apparently believed to have tuberculous meningitis and was treated with streptomycin and isoniazid.

He was later admitted to this hospital. He still had a very low grade fever and a gross memory defect. He had nuchal rigidity and evidence of meningitic signs. Optic discs were hazy, suggesting perhaps that there was increased intracranial pressure. Now, however, the focal signs—the Babinski and Oppenheim—were on the left and the biceps and patellar reflexes were increased over the left. The signs seem to be shifting, the only consistency being the persistence of ataxia and gross intention tremor. The lack of sensory impairment and cranial nerve signs seemed to me to be particularly significant. They are even more significant when we look at the laboratory findings at the Veterans Hospital. The opening pressure of 320 mm. and a closing pressure of 130 mm. constitute a striking drop. Ordinarily when one finds an opening pressure of 320 mm. one doesn't take out much fluid. If that were true in this case, a closing pressure of 130 mm. would suggest a block of flow at the level of the foramen magnum. In other words, there is a small volume of spinal fluid available under increased pressure and when you take out a small portion there is a much more marked drop in pressure than if there were continuity throughout the ventricular system. This, then, does suggest a block. It seems significant that the clinical findings began with disturbances of consciousness and headache—diffuse signs. They focalized principally in the form of ataxia and perhaps now the development of pyramidal tract findings on the left. How can we put this together? The absence of cranial nerve signs militates against a lesion involving the posterior fossa and encircling the base of the skull such as one might expect in tuberculous meningitis. Ordinarily one would expect some evidence of cranial nerve paresis, some diplopia, sixth nerve palsy, sometimes pupillary changes. The only concrete sign which has localizing value in this case seems to be ataxia, and it suggests involvement of the cerebellar outflow.

There is not a very clear distinction here, between resting postural tremor, head tremor and gross intention tremor. This might have some value inasmuch as we expect intention tremor as the result of hemispheral cerebellar involvement whereas we would expect trunkal tremor from involvement of the cerebellar vermis. We have not yet distinguished between a mass lesion of this cerebellar area and a lesion involving the cerebellar outflow. The shifting signs of pyramidal tract involvement are more likely due to pressure changes within the posterior fossa than to alterations in the cortex. There is no convincing evidence of a lateralized cerebral hemisphere lesion. Anatomically then, our signs point to the posterior fossa and if one also considers the nuchal rigidity and signs of meningitis, to the subarachnoid space. Now may we have x-ray findings?

RADIOLOGIST: The chest x-ray of January shows an infiltrate on the right side. There is a nodular density and another nodule in the lower lung field. The disease appears to be confined entirely to the right lung. We don't have a lateral view to recognize whether the infiltrate is in the upper lobe or the B_8 segment of the lower lobe. It is very likely that all three lobes are involved on the right side. The lesions are non-specific in character. They look more inflammatory than neoplastic from the standpoint of the radiologist. We are dealing then with a relatively chronic disease of the right lung involving multiple lobes. The next is a plain film of the skull, which really gave us no information. The next series of films represents a ventriculogram (Fig. 1) which demonstrates a rather uniform dilatation of the lateral ventricles and to a slightly greater extent the anterior horns. The 3rd ventricle is possibly slightly dilated but could well be within normal limits. And on the last film I think you can see the 4th ventricle, which does not appear to be dilated. This mind, you, is a ventriculogram so that air was introduced through the trephine openings directly into the ventricles.

A film was taken the following day and there was still a great deal of air left in the ventricular system indicating that absorption was reduced. There was no air over the surface of the brain on the twenty-four-hour film. On that basis it was concluded that there was evidence of obstruction at or near the base of the 4th ventricle. Next is the cerebral angiogram (Fig. 2). In the lateral projection the vessels appear to be displaced downward from the skull. If we found this in an individual with a history of head injury the obvious diagnosis would be a sub-dural hematoma. However, in this case the apparent separation is due to some tilting of the head, throwing part of the uninjected half of the brain and skull beyond the injected half.

But as we go on we find that there are findings within the brain itself which are abnormal. You will notice that the anterior cerebral artery is in normal position in the midline with the exception of the basilar portion which appears to be slightly elevated. And the middle cerebral artery appears to be somewhat depressed. This suggests that there may be a mass deep in the brain substance in this area which is displacing the middle cerebral artery downward and slightly laterally. On the venous phase films, there is a vague suggestion of opaque material within the brain substance which does not conform to the normal vascular pattern and which suggests what we normally call "staining." This, however, is very ill-defined and it is really quite questionable.

On summarizing the x-ray findings then, we have a man with a number of pulmonary lesions unilaterally, fibroid in character, and most likely inflammatory in nature. We have evidence of obstruction below the 4th ventricle with a moderate degree of hydrocephalus involving to a minimal degree the 3rd ventricle



Fig. 1. Air ventriculogram showing dilation of lateral ventricles.



Fig. 2. Right cerebral angiogram. See text.

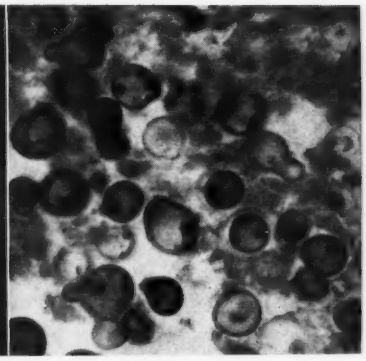


Fig. 3. See text.

and to a rather prominent degree the lateral ventricles. There is evidence to suggest that there is a space occupying lesion in the temporal-frontal area displacing the middle cerebral artery slightly.

DR. MORRELL: I don't think the roentgenologic findings are definitive, with one exception. The 4th ventricle was visualized so that some determination of the site of block could be obtained. We do have evidence, of course, of increased intracranial pressure clinically and by spinal tap. I still think that the bulk of clinical evidence points to a posterior fossa localization involving the cerebellum or cerebellar outflow. Laboratory evidence tends to support this in pointing to the outlet of the 4th ventricle as a site of block. Now then let us attempt to analyze the etiology of this process. We have evidence of low grade fever suggesting an infectious process and a long course suggesting a chronic process. In addition, the leukocyte count in the peripheral blood is not markedly elevated; in fact, not elevated at all in the beginning, and there are no other significant laboratory findings except for the persistently elevated spinal fluid protein and evidence of continued elevation as the disease progresses. The sugar in the spinal fluid remains low. These findings are suggestive of chronic infectious disease involving the meninges and perhaps to some extent the cerebral substance. Spinal fluid cells are fairly low—97 per cu. mm. with a fair predominance of polymorphonuclears. The cultures for acid fast bacteria and for fungi were negative. It might be of interest to know whether any guinea pig inoculations were made of this material.

DR. ZINNEMAN: Only cultures were obtained.

DR. MORRELL: What evidence do we have which will enable us to distinguish what possible infectious process is involved? Most of the fungal diseases and tuberculosis involve a chronic course with a predominance of lymphocytes in the spinal fluid, low grade fever, with increased protein and decreased sugar in the spinal fluid. Most also involve exudative material principally around the base of the brain, and many of the fungi, as you know, are associated with pulmonary involvement as well. Ordinarily, negative skin tests for tuberculosis and for fungi would be highly significant. However, in overwhelming infections one sees negative skin tests. The fact that the patient did not respond at all to streptomycin and isoniazid is somewhat against the presence of tuberculous meningitis. What other kinds of meningitis may be involved? Actinomyces, cryptococcus, and blastomyces are all possible agents. Ordinarily actinomycosis produces a much more acute process with polymorphonuclear spinal fluid reactions and with a pretty frequent incidence of the organism in the spinal fluid. In the others one often has a great deal of difficulty in culture or identification of the organisms. The absence of a pellicle is some argument against tuberculosis but not a great one. I am somewhat impressed with the pulmonary findings as related to the meningitic process. It is, of course, well known that metastatic lesions from lung are common to the brain and the meninges. Meningeal carcinomatosis is known to produce a lymphocytic reaction in the spinal fluid, to produce increased protein in the spinal fluid and a decreased sugar. In a very large proportion of cases there is very often a block and dissemination of tumor cells throughout the fluid. It is also quite common that these cannot be identified on smears. They may be mistaken for large lymphocytes, but no tumor cells were observed in this case. I am not sure whether it is really possible to distinguish between these alternatives—that is, the alternatives of a chronic meningitis—cryptococcosis and blastomycosis are the ones I think of—and a meningeal carcinomatosis. The subsequent course does not help us to distinguish either. Most of the subsequent laboratory findings may very well be due to cortisone therapy. I might ask, by the way, why cortisone was given to this patient. Was it administered to dissolve an exudate?

DR. ZINNEMAN: It was given for that reason.

DR. MORRELL: The terminal findings—the elevation in blood pressure, the Cheyne-Stokes respiration—are fairly easily ascribed to increased pressure and to involvement of the brain stem system by the disease process. One other question which I might raise is whether or not this is simply a chronic infectious process with an exudate around the base of the brain

involving the cerebellar system or whether or not there is a mass in the form of either a metastasis or abscess in the cerebellum to account for the severe ataxia. One argument against an exudate at the base of the brain is the lack of cranial nerve signs. These should be involved fairly early in such processes. I don't think one can still completely rule out tuberculosis, but I will take a chance and suggest that a fungus infection is the better possibility, with the comment that meningeal carcinomatosis with multiple metastases is another alternative.

DR. ZINNEMAN: Thank you very much, Dr. Morrell. Before we hear our discussions, let us have the students' diagnosis.

DR. HAGEN: Six are in. Out of the six, five thought that subacute bacterial endocarditis explained the findings, but one man, thought that this patient had blastomycosis.

DR. ZINNEMAN: Any discussion?

DR. BELL: I was not quite clear how Dr. Morrell explains the ataxia. Will he tell us?

DR. MORRELL: We have no evidence of sensory involvement, but evidence of shifting pyramidal tract involvement and a marked intention tremor involving all extremities. It seems to me that this points to cerebellar involvement, but that, if there was a trunkal ataxia as well, the vermis of the cerebellum, or the cerebellar outflow may be involved.

DR. BELL: Is there any other brain lesion that would cause ataxia other than the cerebellar lesion?

DR. MORRELL: Yes. One sees ataxia in frontal lobe lesions. On the other hand, this is usually associated with pyramidal tract signs. It is very often associated with irritability and psychological disturbances which this patient manifested but which are also quite common with meningitis of any sort. I think that in the absence of a ventricular shift, and absence of any indentation of the lateral ventricle I would suspect that the ataxia was not of frontal lobe origin but much more likely to be cerebellar.

RESIDENT PHYSICIAN: The statement was made in the protocol that the patient tended to fall to the right. Does that help you in the localization of the potential space occupying lesion?

DR. MORRELL: I don't really think so. It is sometimes said that there is a tendency to fall ipsilaterally, but very often one sees falling to either side in cerebellar lesions.

RESIDENT PHYSICIAN: Is the fact that he tends to fall suggestive of a cerebellar lesion?

DR. MORRELL: Yes.

DR. HALL: I would like to know how Dr. Morrell interprets the deviation of the intracerebral vessels.

DR. MORRELL: This would fit with a diagnosis of metastases and I think it is a real possibility. There is not a marked shift, however, and in the presence of fever and other signs of infection I think I would probably put a chronic infectious process first.

DR. HALL: How about the possibility of inflammatory exudates or edema.

DR. MORRELL: I think this is possible for the anterior cerebral deviation. I don't think it is very likely for the depression of the middle cerebral artery.

DR. ZINNEMAN: How did the dura appear to the neurosurgeons when they performed the trephine procedures? There is no report on this item, but I assume that it looked normal.

DR. BELL: You might ask why they didn't give us a biopsy of that dura when they had it out.

DR. ZINNEMAN: I don't know why.

Discussor's Diagnosis

1. Meningitis and pulmonary involvement due to fungi such as Cryptococcus neoformans or Blastomyces dermatitidis.

Clinical Diagnosis

1. Tuberculous meningitis.
2. Pulmonary tuberculosis.

Pathologic Discussion

DR. FINLEY: The body was well developed, well nourished and there were many faded petechia on the abdomen and the anterior surfaces of the arms. In the middle lobe of the right lung there was an area of nodulation measuring 2x3x3 cm. These lesions were firm but not hard. They were nodular and their outlines were fairly distinct. There were a few other indistinct nodulations in the right lower lobe in the B_6 segment but none in the right upper lobe. Sections through these areas revealed areas of greyish-yellow crumbly necrotic material with thin irregular zones of fibrosis around them. There was a thick granulomatous exudate over the base of the brain in the cerebellopontine angle and less extensive patches over the meninges elsewhere. Scattered immediately beneath the exudative areas, particularly in the hippocampus, in the occipital lobe around the calcarine fissure and in the insular gyrus there were small focal areas of necrosis, usually just beneath the surface, in the grey matter. The lateral ventricles were greatly dilated. The third ventricle was slightly dilated. The fourth ventricle was slightly decreased in dimension. It was not dilated. There were focal areas of necrosis in the cerebellum. The largest one was 2 cm. in diameter.

Microscopically, the lesion in the lung showed a solid accumulation of inflammatory and necrotic debris. The alveoli contained some necrotic debris and some acute inflammatory cells but were also extensively filled with the offending organism. The organisms are doubly contoured, oval to round yeast forms, and some of them produce single buds. This is the classic description of blastomycosis (Fig. 3). A periodic acid Schiff-stain shows whole fields filled with blastomyces dermatitidis.

There were multiple scattered abscesses in the brain, in the cerebellum, some in the cortical area of the occipital gyrus, in the calcarine fissue area, in the insular gyrus and in the cerebellar peduncle, and heavy accumulations in the meninges.

Final Anatomical Diagnoses

1. Pulmonary blastomycosis (Blastomyces dermatitidis).
2. Meningeal blastomycosis with cerebral and cerebellar blastomycotic abscesses.

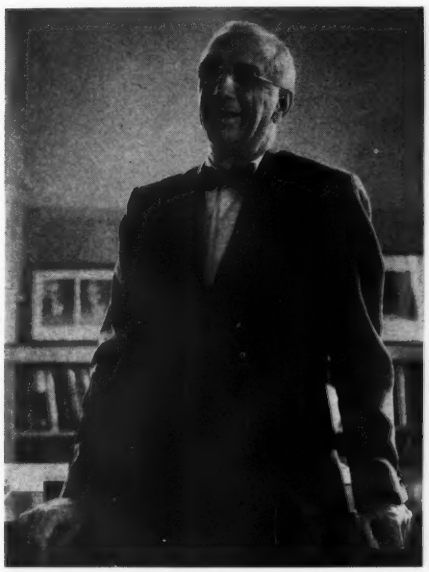
Editorials

JOHN F. BRIGGS, M.D.
ARTHUR H. WELLS, M.D.
HENRY G. MOEHRING, M.D.

A GOLDEN ERA IN MINNESOTA MEDICAL EDUCATION

A golden era of personal leadership in medical education at the University of Minnesota drew to a close on June 30, 1958. On that date, Dr. Harold S. Diehl left the deanship of the College of Medical Sciences, a post which he had occupied with distinction for more than two decades. Lasting evidences abound testifying to the effectiveness of his service as dean of the state's medical school. These include internationally recognized contributions by the faculty to medical research, national prominence of the school in medical education, and the magnificent physical facilities of the University Medical Center. But to Harold Diehl, the most significant evidence of a medical school's greatness is the quality and professional contributions of its *raison d'etre,* the educated physician graduated from its halls. Thus he could feel an understandable sense of mission accomplished when he surveyed the roster of more than 2,500 physicians who received their M.D. degrees during his administration. Approximately 45 per cent of these, he could reflect, have placed their professional emphasis on the practice of family medicine. He could refer with a pardonable trace of pride to published data which indicate that, for a recent twenty-year period (1930-1949), Minnesota's Medical School joins Harvard as national leader in the number of graduates serving in full-time academic positions on medical school staffs.

The appointment of Dr. Harold S. Diehl to the deanship at Minnesota occurred in 1935. His previous experience had provided an admirably diversified medical, educational, and administrative background for this post of high leadership at the helm of a young and potentially great medical school. This extensive background included study in medicine, pathology, bacteriology, and public health; teaching experience in several fields; military and administrative experience in Europe during and following World War I; direction of the Student Health Service at the University of Minnesota; organization of the University's Department of Preventive Medicine and Public Health; and authorship of several volumes on health for students and the public. Under Doctor Diehl's direction for more than two decades of burgeoning size and prestige in education, research, and service, the College of Medical



HAROLD S. DIEHL, M.D.

Sciences at Minnesota grew to full maturity in the eyes of the people of Minnesota, sister medical schools, universities throughout the world, and the profession to which it contributed.

Doctor Diehl brought to bear a scholarly and carefully reasoned approach to the sweeping problems which confronted him as a medical administrator and educator. His very background as student, instructor, university faculty member, scientific researcher, and author inevitably laid the foundation for a studious, logical attack on any question presented to him.

Yet the viewpoint of this seasoned administrator swept far beyond the purely intellectual. Undoubtedly, a major factor in his effective handling of many a knotty problem was his ability to contribute consistently a multi-faceted approach, the overall view, an invaluable sense of balance of forces and events.

Harold Diehl, for all his administrative genius at the head of a large and complex educational enterprise, will be remembered most dearly by many as the true personal friend and counselor. His gracious, sympathetic, informal manner in associations with his colleagues inspired dedication to the man and to the institution which he led. His sincere, infectious grin and his well-selected humorous anecdotes reduced many a potentially tension-packed administrative issue to a calm, congenial discussion of the pertinent facts available and the possible alternative courses of action. A stranger quickly became a colleague in the councils chaired by Doctor Diehl. His contagious warmth of personality, punctuated by a hearty handshake and that large smile, tended to dissolve reserve and prejudice.

There is a notable exception to the smooth efficiency and rapidity which characterized Doctor Diehl's progress toward a given objective. Anyone who has accompanied him into a meeting hall or to a luncheon table has found progress in this single instance to be exceedingly slow. How can it be otherwise when a man stops as frequently along the way as does "The Dean" to greet and converse with his many friends and colleagues?

The eminent success which Doctor Diehl enjoyed as a medical school administrator was derived in large part from his ability to recognize and gather about him outstanding medical educators and leaders for direction of departments and divisions. Once appointed, a department head could move energetically forward with the assurance that he had the confidence and backing of the administration of the Medical School to develop his area to the fullest. On this basis, Dean Diehl enjoyed excellent rapport with his faculty, which at the same time recognized him completely as the leader and spokesman for the school.

Never one to spare himself from new challenges to serve medical science and the public, Harold Diehl was intrigued with the possibility of continued professional service when, in 1957, the American Cancer Society solicited his vast reservoir of experience and administrative ability for national leadership as Senior Vice President of that organization. Knowing that retirement regulations of the University of Minnesota would, in 1960, bring to a close his long and fruitful career as a medical dean, Doctor Diehl was attracted by the Cancer Society's well-conceived plan to utilize for many years to come his unique capabilities and background in the health sciences. Thus the Medical School's loss of its captain became a distinct gain in the far-flung battle against cancer when the Dean began, late in 1957, to transfer a major portion of his administrative time and effort to New York City.

Those of us who are relatively recent junior colleagues of Dr. Harold S. Diehl consider it a distinct privilege to join the host of his co-workers and friends in a sincere and enthusiastic salute to him and to wish him and his life-long partner, Julia Diehl, the overflowing cup of happiness in their new area of service to medicine and to the nation.

H. Mead Cavert, M.D.
Assistant Dean
College of Medical Sciences
University of Minnesota

ADRENOCORTICAL STEROIDS

The first editorial of this series dealt with the laboratory aspects of these compounds, and now we can review in broad outline some of the indications for the use of the adrenocortical steroids. Probably no other agents have been applied so widely and effectively for so many conditions. Use of these compounds has ranged from their basic application in adrenal deficiency states to the wider field of non-specific anti-inflammatory and anti-allergic effect in conditions such as rheumatoid arthritis and severe asthma. In applying the steroids in our practice, we must always bear in mind that we are using them in many cases to suppress the body's response to inflammation. While this may be rewarding to the patient, potential hazards such as spread of infection must be borne in mind, and such therapy, therefore, represents a calculated risk. The benefits should always be weighed against the risk to the patient, and each case must be judged essentially on its own particular merits.

A medical dictionary defines rheumatoid arthritis as: "a chronic disease of the joints, usually polyarticular, marked by inflammatory changes in the synovial membranes and articular structures and by atrophy and rarefaction of the bones." To our patients, it often means something quite different—incapacity leading to economic stress and finally to collapse of their whole mode of life. Many

This is part two of a four-part editorial.

develop a feeling of hopelessness for the future. In their eyes, therefore, the advent of cortisone was an event of unparalleled importance. As we look back now, we can appreciate their feelings when it became apparent that cortisone could only control to a varying degree the joint manifestations of the disease, and perhaps even then only at the expense of side effects which, even if not dangerous, were unpleasant.

It is in this field of arthritis, therefore, that our newest steroids will be found to have a wide acceptance. Their increased potency offers little in itself, but if one adds to this a reduction in the incidence of side effects, such as edema, then we have truly made a therapeutic advance. Present indications are that these newest steroids do offer these advantages. Opinions are still divided as to the most satisfactory way of commencing corticoid therapy in these patients. Some believe that one should start with a high initial dosage and rapidly reduce it, while others prefer to commence with a minimally effective dosage of the corticosteroid and increase it gradually until an optimum state of clinical control is achieved. Whichever mode of initiation of therapy we prefer individually, we must bear in mind that this represents a round-the-clock addition of corticoids to the system, and in turn leads inevitably to atrophy of the adrenal cortex with resulting suppression of endogenous production of 17-hydroxy-corticoids. These patients, therefore, must be considered in the same light as the Addisonion patient and, if subjected to severe stress, surgery or injury, they require the immediate administration of parenteral hydrocortisone and further careful observation.

A review of the literature shows that certain cases of adrenal insufficiency (Addison's disease or secondary to anteriopituitary corticotropin deficiency) require in addition to cortisone or hydrocortisone, administration of a sodium retainer such as 9-alpha-fluoro-hydrocortisone. The lack of sodium-retaining propensity in our newer steroids, so valuable in the long-term therapy of other conditions, often prohibits their use and always limits their value in this state. They have no established place in the management of true adrenal insufficiency.

In the field of renal disease, the use of steroid therapy has been virtually limited to the treatment of nephrosis. Today, the tendancy to differentiate between adult and childhood nephrosis has all but gone, or indeed, even to separate those patients with so-called "pure nephrosis" from those nephrotic patients who exhibit nephritic signs, such as hematuria and hypertension. A clinical remission of the syndrome occurs when the glomerular permeability to protein returns to normal. This is followed by a rise in serum albumen concentration and a diminution in albuminuria. Since 1950, the adrenocortical steroids have played an increasing rôle in the management of nephrosis. Their administration has often resulted in a prompt diuresis followed by a fairly classical remission. The mechanism of action of the steroids in this respect is still incompletely elucidated. The remissions are often of short duration, and experience would seem to indicate that intermittent therapy with these compounds may be necessary in order to maintain the patient in his initial remission stage. Hyperkalemia has been reported following this therapy, but should be less likely to occur with steroids such as prednisone and prednisolone, and the newer compounds such as methylprednisolone.

JOHN J. PEPPER, M.D.

FEDERAL DAM PLANNERS NEVER CHANGE

Federal dam planners never change. They keep on clamoring in Washington for your tax money to build dams in areas where the people want to take care of their own power needs.

Take the Pacific Northwest today. Investor-owned companies and local agencies are spending close to $1 billion on the largest hydro-electric program to be built at any one time in any sigle area in the history of America.

Local initiative in this area can boast 4.6 million kilowatts of hydro-electric power under construction, just completed or definitely licensed for development. That's as many kilowatts as the Federal Government took a quarter of a century to build in the area—including the huge Coulee, Bonneville and McNary dams.

And the local program is just getting started. Also seriously being considered by the people of the Pacific Northwest are projects designed to produce an additional 4 million kilowatts.

In spite of these magnificent accomplishments, the federal power people keep shouting for more and more taxpayer money for this area—an area which has proven it can take care of its own power needs.

Representative Ben F. Jensen (R-Iowa), ranking minority member of the House Appropriations

Committee, has expressed "deep concern about the proposals of federal power advocates for the expenditure of taxpayer money for the development of our water resources when local interests are willing and able to develop them in a comprehensive manner in keeping with the requirements of law as embodied in the Federal Power Act."

BIRD WATCHING IN THE DOORYARD

When the topic of birds comes up in conversation, I often hear the remark, "We have nothing but Robins and English Sparrows around our yard." I am always sure that remark is a gross understatement, but actually, how many birds is it possible to see around an average dooryard in such locations as Saint Paul and Minneapolis, suburban areas, or in less populated centers throughout the state? I submit that even a cursory check would reveal quite a sizable list.

Since 1942, I have kept a very casual list of birds seen each year. I have made no attempt to set a record or even to keep a complete list. During several years of this period, I have been away from the campus during the summer school or have been engaged in work that made anything like systematic bird watching impossible. No bird was included on my list unless I saw it on the campus and had sufficient opportunity to be certain of my identification. Birds marked with an asterisk (*) are known to have nested on the campus. Others probably were also breeding birds, but no nests were found.

The regular year-around or permanent residents are:

Pheasant*
Screech Owl
Downy Woodpecker*
Hairy Woodpecker
Blue Jay*
Crow*
Chickadee
White-breasted Nuthatch*
English Sparrow*
Starling*
Cardinal*

The occasional winter residents or visitants have been:

Brown Creeper
Cedar Waxwing*
Slate-colored Junco
White-winged Crossbill
Common Redpoll

The list of summer residents and migrants is long. In the first part of the list are those that occur repeatedly in my records. The second part of the list includes those that have been seen only once or twice. The regular migrants and summer residents on the Campus are:

Great Blue Heron
Green Heron
Mallard*
Blue-winged Teal
Lesser Scaup
Sparrow Hawk*
Coot
Killdeer*
Black Tern
Mourning Dove*
Nighthawk*
Chimney Swift*
Hummingbird
Belted Kingfisher
Flicker*
Olive-backed Thrush
Veery*
Eastern Bluebird*
Golden-crowned Kinglet
Ruby-crowned Kinglet
Cedar Waxwing*
Red-eyed Vireo
Warbling Vireo*
Black and White Warbler
Yellow Warbler
Magnolia Warbler
Myrtle Warbler
Chestnut-sided Warbler
Palm Warbler
Ovenbird
Northern Yellow-throat*
Yellow-bellied Sapsucker*
Red-headed Woodpecker*
Eastern Kingbird*
Crested Flycatcher*
Wood Pewee
Phoebe
Tree Swallow*
Bank Swallow
Purple Martin
Brown Creeper
House Wren*
Catbird*
Brown Thrasher*
Robin*
Hermit Thrush
American Redstart
E. Meadowlark*
W. Meadowlark*
Red-winged Blackbird*
Baltimore Oriole*
Bronzed Grackle*
Cowbird*
Scarlet Tanager
Rose-breasted Grosbeak*
Red-eyed Towhee
Goldfinch*
Tree Sparrow
Chipping Sparrow*
White-throated Sparrow
Fox Sparrow
Song Sparrow*

Migrants and summer residents seen only once or twice:

Eared Grebe
Pied-billed Grebe
Black-capped Night Heron
Shoveller Duck
Hooded Merganser
Cooper's Hawk
Bobwhite
Sora
Woodcock
Spotted Sandpiper
Solitary Sandpiper
Yellow-billed Cuckoo
Black-billed Cuckoo
Pileated Woodpecker
Western Kingbird
Wood Thrush
Blue-headed Vireo
Yellow-throated Vireo
Tennessee Warbler
Orange-crowned Warbler
Black-throated Green Warbler
Nashville Warbler
Blackburnian Warbler
Blackpoll Warbler
Northern Water Thrush
Wilson's Warbler
Canada Warbler
Orchard Oriole
Rusty Blackbird
Brewer's Blackbird
Indigo Bunting
Field Sparrow
Savanna Sparrow

The occurrence of some of the water birds on the regular list may seem strange for a residential area in a large city. There is a small lake on the campus which regularly attracts migrating water birds in small numbers, probably wanderers from the main flocks. For the past three years, a pair of Mallards have stopped on the campus. A nest was suspected in 1955 but could not be found. In 1956, a brood of eleven ducklings was hatched. In 1957, after braving the heckling of small boys and their dogs for several weeks, both members of the pair disappeared. Black Tern feed regularly around this lake. At almost any time during the summer lone Blue or Green Herons can be seen in the early morning or toward dusk. A second factor that

may account for some of the other unusual species is an undisturbed wooded area on the campus. Albeit the campus is a favorable spot to observe birds, the number of birds that have been seen is still a fair indicator of the kind of bird watching that is possible without going very far afield.

SISTER ST. MARK WIRTZ, M.S.
The College of St. Catherine

EDUCATIONAL TELEVISION

Adult Education by Television

One of the most pressing concerns of thoughtful students of our society is the question of the continuing education of our people. The American electorate will be called upon to decide questions having to do with numerous, highly technical matters which simply were not known twenty or even ten years ago. A man of forty-two years who graduated from college in 1937, assuming he attended the best possible college, that he was the finest student in the college, and that he was instructed by the finest professors in the world, as a student would still never have heard of atomic fission, penicillin, the Dead Sea scrolls, existentialism, progressive Republicanism or Sputnik II. The names of Dwight, Eisenhower, Adlai Stevenson, Konrad Adenauer, Charles DeGaulle, David Ben-Gurion and Habib Bourguiba would have been almost totally unfamiliar. Space alone forbids the listing of literally thousands of other things, places and concepts which are vital to our progress, thought and perhaps even survival today which were not taught or, for that matter, even speculated upon, a mere twenty years ago. Yet our college graduate of 1937 is now likely to be in a position of considerable influence in our society, a position which will increase in importance as the years go by. He will have to take a part in the momentous decisions of our time. He will be looked to, by those not his equals in age or education, for decisions on these matters about which he was never taught and concerning which he has probably received only the most casual sort of information. This, in a short paragraph, is the central problem of adult, or continuing, education.

Obviously, the press, books, magazines and commercial radio and television can and do fill a part of this educational gap. However, it is equally obvious that all of these media have other and more pressing responsibilities than supplying the need for continuing education. Not the least of these responsibilities is that of making enough money to remain in business. Most of these media, for this and other reasons, cannot stray too far away from popular taste. But study of abstruse scientific and philosophical matters is seldom a "popular" activity. It will not ordinarily appeal to more than 10 per cent of the people, perhaps to even less. No newspaper publisher or commercial television manager can direct his message to so small a group and hope to survive in competition. Yet 10 per cent of our population is seventeen million people, and these are the people who want to know, and who *must* know, the world around them if we are to survive.

Educational television is perhaps the best method yet devised of reaching this 10 per cent who desperately need continuing education. Certainly, it is the least expensive way we have yet devised to inform them of what they want to know. KTCA-TV is a young station, as educational stations go, but in its third month of operation, it could and did provide literally tens of thousands of viewers with the latest and best available information on the history, politics, economics and geography of our enemy, the Soviet Union. This information was given by highly skilled teachers from Hamline University, Macalester College and the Colleges of St. Catherine and St. Thomas. A knowledgeable professor from the University of Minnesota explained, in detail, the nature of our own American government to tens of thousands more. A Nobel prize winer, Dr. Glen Seaborg, instructed thousands in chemistry by his filmed series "The Elements." The National Broadcasting Company made available to all educational television stations a fine live series on mathematics and another on the executive branch of the government, while the function of the engineer in our society was explained by eminent local authorities. And all of this was only a small segment of one week's programming on one educational television station.

No one can know what the full impact of educational television will be on adult education in the years immediately ahead. Only those of limited vision, however, will suggest that its influence will not be very great indeed.

JOHN C. SCHWARZWALDER

LAY VERSUS MEDIC OWNED PUBLICATIONS

Obviously, there are definite differences between medical journals which represent medical organizations and those published by commercial agencies for free distribution. I doubt that the trend toward the use of free distribution periodicals can be

changed. Doctors are overwhelmed with periodicals, and direct-by-mail solicitation through letters, circulars and brochures is becoming too expensive.

The free distribution publications fall into two groups: (1) those which carry general advertising, among which the leaders are *Modern Medicine, MD,* and *Medical Economics,* and (2) those devoted to the interests of an individual pharmaceutical house such as *Scope* (Upjohn), *World-Wide Abstracts of General Medicine* (Warner-Chilcott), *Seminar Report* (Merck), *Spectrum* (Pfizer), *PB* (Lilly), *News* (Ciba), *Therapeutic Notes* (Parke, Davis). Obviously, then, success will depend on the ability of individual editors to make their publications sufficiently attractive or useful to the medical profession to gain the reader's interest and thereby secure his attention.

I am afraid that editors of state medical journals particularly do not have sufficient choice of material that is new and valuable and sufficiently well presented to compete with the free distribution publications which have large budgets sufficient to pay for material that they select which can be published in four colors with innumerable illustrations and which can be kept up to date or even be far in advance of any organizational publication.

Organizational publications moreover, have tended more and more in recent years to be concerned with political affairs, either those of their organization or those related to government. The prolixity and lack of originality and leadership in the latter material has tended to make most medical readers, as far as I can learn, ignore it. More attention is paid to news letters than to the publications.

I have been interested in observing some changes in the circulation of medical periodicals since I discontinued editing of the *Journal of the American Medical Association* in 1950. At that time, the *New England Journal of Medicine* had about 8,000 circulation; it now has 55,000. This is a voluntary subscription publication except for the membership of the New England group. At that time, *Postgraduate Medicine* had 15,000 circulation; it now approximates 40,000 circulation. This is a privately owned voluntary subscription publication with no captive circulation. Apparently, Editors Joseph Garland and Charles Mayo have been able to survive and to progress in the face of competition.

MORRIS FISHBEIN, M.D.

NEW LAW—REGISTER X-RAY APPARATUS

All physicians must register their x-ray apparatus and "tell sources of ionizing radiation" with the Minnesota Board of Health during the month of March. Read details in Public Health section of this issue of the journal.

MEDICAL TECHNOLOGIST OR LABORATORY AID?

Check the following lists and know the difference.

AMA—Approved

1. The Registry (ASCP). Established and incorporated in Colorado in 1928. Operating out of Muncie, Indiana, under the chairmanship of Dr. Lall G. Montgomery of Amer. Society Clinical Path.
2. The American Society of Medical Technologists, ASMT, incorporated in Michigan and functioning since 1933 is official society of registered candidates.
3. "Approved Schools"—approved by the Council on Medical Education and Hospitals of the American Medical Association.
4. Registration examinations prepared and/or edited by members of the Board of Registry (ASCP).
5. Registration insignia for successful candidate: "M.T. (ASCP)."
6. Official Organ: *The American Journal of Medical Technology.*

AMA—Not Approved

1. The American Medical Technologists, AMT. Established in New Jersey about 1940. Operates out of Easthampton, Massachusetts, under the secretaryship of Mr. C. A. Bartholomew.
2. The American College of Medical Technologists, the ACMT, established and incorporated in New Jersey in 1942.
3. "Accredited Schools"— accredited by the Council on Education, Qualifications and Standards of the American College of Medical Technologists, not sanctioned by the AMA.
4. Registry examinations prepared by an "impartial board of qualified examiners," not approved by the AMA.
5. Registration insignia: "M.T."
6. Official Organ: *Journal of American Medical Technologists.*

American Medical Association

Report on Actions of House of Delegates, Twelfth Clinical Meeting

Total attendance at the Twelfth Clinical Meeting of the American Medical Association held in Minneapolis, December 2-5, was 6,072. Included were 3,003 physicians, 664 medical students, nurses, and technicians, and 2,405 guests. A wide variety of issues were considered by the House of Delegates.

Dr. Lonnie A. Coffin of Farmington, Iowa, was named the 1958 General Practitioner of the Year for his outstanding contributions to the health and civic affairs of his home community. Dr. Coffin, who is the first Iowan to receive the annual GP award, accepted his gold medal on behalf of "all the men who have dedicated their lives to the general practice of medicine."

Speaking at the Tuesday opening session of the House, Dr. Gunnar Gundersen of La Crosse, Wisconsin, AMA President, called upon the medical profession to exert leadership and imagination in meeting the problems of these changing times. Urging practical actions to solve medico-economic challenges, Dr. Gundersen declared that "the time has passed for policies based on generalities, platitudes and flag-waving." He also suggested that the Association offer support and co-operation to proposals for an International Medical Year.

Governor Orville L. Freeman, of Minnesota, who also addressed the opening session, asked for "the help of the leaders of the medical profession in working out a program that will most adequately meet the needs of our older citizens for health care and services of the highest quality."

Health Care of the Aged

The House of Delegates adopted the following proposal submitted by the Council on Medical Service and endorsed by the Board of Trustees for help in meeting the health care needs of the aged:

"For persons over sixty-five years of age with reduced incomes and very modest resources, it is necessary immediately to develop further the voluntary health insurance or prepayment plans in a way that would be acceptable both to the recipients and the medical profession. The medical profession must continue to assert its leadership and responsibility for assuring adequate medical care for this group of our citizens.

"Therefore, the Council on Medical Service recommends to the House of Delegates the adoption of the following proposal: That the American Medical Association, the constituent and component medical societies, as well as physicians everywhere, expedite the development of an effective voluntary health insurance or prepayment program for the group over 65 with modest resources or low family income; that physicians agree to accept a level of compensation for medical services rendered to this group which will permit the development of such insurance and prepayment plans at a reduced premium rate."

In order to effect the immediate implementation of such a program, the House directed that copies of the proposal be distributed to medical society approved plans, including Blue Shield and private insurance programs, requesting their co-operation.

Commission on Medical Care Plans

After two hours at a reference committee hearing, the House of Delegates decided to defer action on the report of the Commission on Medical Care Plans until the June 1959 meeting. The delegates adopted this statement:

"We respectfully suggest to the constituent associations reviewing the report in the interim, that their attitude regarding the report will be clarified if they arrive at some decisions in regard to the following basic points:

"1. **Free Choice of Physician.**—Acknowledging the importance of free choice of physician, is this concept to be considered a fundamental principle, incontrovertible, unalterable, and essential to good medical care without qualification?

"2. **Closed Panel Systems.**—What is or will be your attitude regarding physician participation in those systems of medical care which restrict free choice of physician?

"These suggestions acknowledge that the policy of the American Medical Association to encourage and support the highest quality of medical care for all patients remains unchanged. They question, however, whether attitudes toward the free choice of physician and the closed panel system may be undergoing evolutionary change."

The House recommended that the Board of Trustees invite the constituent associations to forward their replies to these questions to the Executive Vice President sixty days in advance of the June, 1959, meeting.

Osteopathy

Considerable discussion centered on a resolution which would have recognized that constituent medical associations have the right to establish the relationship of the medical profession within their respective states. The House decided, however, that the resolution in question did not offer the appropriate solution to the osteopathic problem. Instead, the delegates requested the Judicial Council to review past pronouncements of the House on osteopathy and the status of the laws of the various states in this regard. The Council was asked to present its report and recommendations at the June, 1959, meeting. The House "noted with favor that the American Osteopathic Association has amended its objectives as stated in its constitution by deleting reference to the cultism of Andrew J. Still."

Medical Education

The House approved a statement by the Council on Medical Education and Hospitals supporting the development of additional facilities for basic medical education, and it urged the entire profession to give that policy strong support in order to correct misinterpretations of the Association's viewpoint regarding the supply of physicians.

"American medicine," the statement points out, "fully recognizes the needs being brought about by the increasing population, social and economic trends, and the changing dimensions of medical knowledge and its application." Urging careful analysis of those needs, the statement says that existing medical schools should consider the possibility of increasing their enrollments and developing new facilities. It also declares that American medicine has the responsibility to encourage the creation of new four-year medical schools and two-year basic science programs by institutions of higher education which can provide the desirable setting.

AMA Administrative Structure

A Board of Trustees report on the administrative structure of the Association was approved by the House, which termed the reorganization of the headquarters staff as a long and important step in the right direction. The report informed the House that the Chicago staff has been divided into the following seven divisions: Business Division, Law Division, Communications Division, Field Division, Division of Scientific Publications, Division of Socio-Economic Activities and Division of Scientific Activities. The latter two are still in the process of development and are temporarily under the direction of the Assistant Executive Vice President. The Board also reported that the Committee on Legislation has been renamed the Council on Legislative Activities, with the Director of the Law Division as Council secretary. This new council will undertake an enlarged, strengthened legislative program, closely co-ordinated with the activities of the new field staff and the Washington office. The latter also has been reorganized, with overall direction coming from Chicago.

AMA Objectives and Basic Programs

The House received and commended the report of the Committee to Study AMA Objectives and Basic Programs, which it said may be a significant milepost in the Association's history. In approving one of the committee's recommendations, the House referred to the Council on Constitution and Bylaws the following suggested amendment of Article II of the Constitution:

> "The objectives of the Association are to promote the science and art of medicine and the betterment of public health and an understanding of the socio-economic conditions which will facilitate the attainment of these objectives."

The House also recommended that the Board of Trustees establish a mechanism which will assume the responsibility for promoting active liaison with each medical society. "In the scientific fields," the House declared, "the role of the A.M.A. should be primarily that of leadership, but every endeavor should be made to bring about co-ordination of the special fields of scientific interest of the other national medical organizations." The delegates also approved a recommendation that the Board of Trustees give serious consideration to opening the publications of the Association to a free and open discussion of socio-economic problems applicable to medicine.

Fund Raising

Once again considering fund raising problems which have arisen since development of the concept of united community effort, the House passed a resolution which pointed out that the action taken last June in San Francisco has been interpreted by some as disapproving the inclusion of voluntary health agencies in United Fund drives. It then

stated that the "American Medical Association neither approves nor disapproves of the inclusion of voluntary health agencies in United Fund drives." The resolution also requested the Board of Trustees to arrange a top-level conference with the voluntary health agencies, the United Funds and other parties interested in the raising of funds for health causes, with a view toward resolving misinterpretations and other difficulties in this area.

Miscellaneous Actions

In dealing with a wide variety of other subjects, the House also:

. . Took notice of the recent restrictive changes in the *Medicare* program; expressed regret at the substitution of federal facilities for private care in the areas mentioned, and urged the Association to encourage the re-establishment of services under the free choice principle to accomplish the original intent of the act.

. . Recommended that the Social Security Act be amended by Congress to permit states to combine the present four *Public Assistance* medical programs into a single program, administered by a single agency and making available uniformity of services to all eligible Public Assistance recipients in the state.

. . Authorized the Council on Medical Service to sponsor at the earliest practicable date a *Congress on Prepaid Health Insurance.*

. . Approved a plan to develop *"Buyer's Guides"* which will be sent to physicians to help their patients analyze the merits of available health insurance programs.

. . Approved a Bylaw amendment which will allow *dues exemptions* for interns and residents serving in training programs approved by the Council on Medical Education and Hospitals.

. . Called to the attention of all individuals or institutions responsible for *intern and resident* training that medical services provided to patients in hospitals are the responsibility of duly licensed physicians.

. . Encouraged the voluntary registration of the *paramedical personnel* who assist physicians, but opposed the extension of governmental licensure and governmental registration at this time.

. . Heartily approved and lauded the purpose, content and format of *The AMA News* and recommended continuance of the publication under its present and established policies.

. . Agreed with the Committee on Medical Practices that *relative value studies* should be conducted by each constituent medical association but not on a national or regional basis by the AMA.

. . Urged each constituent society to establish a committee on *rehabilitation* to carry out activities recommended by the Board of Trustees.

. . Called for continued activity at all levels to stimulate the development of effective *poliomyelitis inoculation programs.*

. . Suggested that the Association take immediate steps toward developing a plan whereby reserve medical units and individuals not immediately involved in military operations could be used to supplement *civil defense operations.*

. . Expressed gratitude and appreciation for the long years of devoted service by *Dr. Austin Smith,* who has resigned as Editor of *The Journal of the American Medical Association.*

At the opening session, six state medical societies contributed a total of almost $250,000 to the American Medical Education Foundation. The gifts were: California, $150,305.75; Indiana, $35,110; New Jersey, $25.000; New York, $19,608; Utah, $9,977.50 and Arizona $8,657.50. In addition, the American Medical Association announced a contribution of $100,000 to the Foundation.

"GOOD HEALTH" IN 1959

The year 1958, now in its twilight hours, brought no startling discoveries in the world of medicine. But during the year there was remarkable progress in vital fields of research and practice.

Important scientific advancement was recorded in space medicine and mental health, and in the fight against diabetes, staphylococci, cancer, and heart diseases, to name a few. And while this progress is not dramatic in itself, it brought researchers nearer discoveries that undoubtedly will prove to be major breakthroughs in the months or years ahead.

A peek into the future, however, indicates that 1959 could be a banner year as far as the health of the nation is concerned. Steps already have been taken to solve the problems rising out of a growing old-age population. And the new year also will see increased activity in medical research, particularly in the study of heart diseases, chronic ailments, and cancer.

The dawn of a new year always brings new hopes to the suffering and new inspiration to the scientists and practitioners. It is the prayer of all that the traditional new year's wish of "good health" will have a real meaning to many before 1959 becomes history. —*AMA News*

President's Letter

FORWARD GLANCES—1959

Dr. Carl Drake of Saint Paul was chosen the 1959 President-Elect of the Minnesota State Medical Association by the House of Delegates at the 1958 annual meeting of the Association in Minneapolis. Shortly thereafter, however, Dr. Drake became ill and he subsequently resigned from his office in the best interests of his health. This resignation was regretfully accepted by the Council, and best wishes were extended to Dr. Drake. Dr. Drake served as editor of MINNESOTA MEDICINE for many years, and would have been an excellent president. We hope that he will be well again soon.

At the October meeting of the Council, in accordance with the Association's by-laws, the Council named me to succeed Dr. Drake. The Council perhaps considered that after I had served more than twenty years as the Association's secretary, it was time for me to move on or out. At any rate, I am quite proud to have been chosen to be your next president. At the same time, I feel rather humble in accepting the office with all its many responsibilities. However, God be willing, I shall endeavor to uphold the stature and dignity of the Association to the best of my ability.

And now that I am in, I find that "time and tide waits for no man" and one of the first exacting duties I have to perform is to write the so-called President's Letter for January with the "dead-line" near at hand. Beginning a new year, therefore, I wish to extend the season's greetings to members of the Minnesota State Medical Association and the many readers of MINNESOTA MEDICINE, and I hope all will have a happy and prosperous 1959.

The year 1958 was a busy one with the many events and meetings, particularly in keeping with Minnesota Centennial (1858-1958). Minneapolis and Minnesota, in general, should be proud of having participated in the State Association meeting which was in close conjunction with the first World Health Organization meeting to be held in this country. Both meetings were successful, and we are still receiving many compliments from various parts of this country and abroad relative to the format of the meetings and also to the wonderful Minnesota hospitality extended to those attending. And last but not least, the Clinical Session of the American Medical Association held in Minneapolis, December 2-5, 1958, was well regarded by those in attendance. We should be forever grateful and thankful to all the doctors and the many committee members who were responsible for the hard work and many hours required to accomplish such a feat, all in the same year.

Looking forward into 1959, there may not be so many major events, but we hope to have a very good annual State Association meeting which will be held this year in Duluth in May. The program is in progress and should be in readiness early this spring. The Minnesota State Legislature will be in session January through April, and we shall be expecting the usual fireworks. There will be many medical and welfare issues, as well as the osteopaths again confronting us to meet our challenge. I am sure, however, that as in the past, we shall all be willing and ready to join together in the best interests of the health and welfare of our people.

In closing, I wish at this time to extend my personal tribute to one Rufus R. Rosell, Executive Secretary of the Minnesota State Medical Association, who is retiring after more than thirty-two years. "Rosey" is a swell guy and we are going to miss him. It has been my pleasure to have worked with him more than twenty years, and I can assure you that he is worthy of the name "Mr. Executive Secretary" —not only in Minnesota, but on the national level as well. I am sure you will all join me in wishing "Rosey" and his good wife, Dorothy, many years of happiness.

Benjamin B. Foulston M.D.

President, Minnesota State Medical Association



BENJAMIN B. SOUSTER, M.D.

President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

MINNESOTA GOVERNOR URGES GREATER MEDICAL CARE FOR THE AGED

Minnesota's Governor, Orville L. Freeman, speaking before the opening session of the House of Delegates of the AMA in Minneapolis, appealed to the medical profession for greater co-operation with government in developing more adequate medical care for the aging programs.

Emphasizing the urgent need for a solution to this problem, Governor Freeman commented:

"We want to make sure that senior citizens whose incomes are small, yet enough for independence as long as no extraordinary expenses are required, need not become 'medical indigents' when they become ill. We want personal dignity as well as health for our later years."

Governor Freeman made these references to the Forand bill which would provide hospital and medical insurance benefits for those eligible under social security.

"It may not be a complete solution or the best solution," he said. "It may not be acceptable to you or to the Congress. But it would offer help to state governments, hard pressed to find ways to meet all the needs for services for which they are responsible."

He emphasized that the medical profession has the right to oppose such legislation as the Forand bill. In fact, he said the profession has the duty to oppose the proposed measure, if medicine believes the bill would be harmful to the public.

"But if you do oppose it," he declared, "you also have the responsibility of helping to work out an alternative program to meet the need that we all know exists and becomes more serious every day."

Governor Freeman pointed out that although social security pensions help the aged to meet ordinary living expenses, they are not sufficient to cover the expense of serious and chronic illness.

"Thus, there are increasing numbers of retired men and women who have earned pensions sufficient to meet their needs as long as they stay well, but insufficient to meet their medical care needs. If and when they become ill, those costs become an increased burden on government.

"Inflation has aggravated this problem . . . Surveys show that, while people past the retirement age need and do spend less on such cost-of-living items as food, clothing and shelter, in contrast they need to spend more on medical care. Their need for such care is probably double that of the average for the pre-retirement years."

In conclusion, Governor Freeman posed these questions:

"Can you help us find a way to apply the voluntary health insurance principle to elderly and retired people?

"Can you help us to develop a program, that is within our means, to provide the kind of preventive care and attention that will make the sunset years healthier and happier?

"Can you help us find ways to make available to all who need it the kind of physical rehabilitation that your scientific progress has already developed?

"We need this help and co-operation urgently. The people feel this need, and when they feel it badly enough, they demand that it be met. The people then say: 'There ought to be a law'."

PEOPLE WANT TO CHOOSE OWN DOCTOR, SURVEY SHOWS

More than three-fourths of the population of the United States want to choose their own doctor. In addition, they want to assume all or part of the responsibility for paying for their doctor bills.

These were among the findings in a survey conducted among a sampling of the adult general population by Opinion Research Corporation, Princeton, N. J., for the American Medical Association.

The purpose of the study was to explore attitudes about the choice of physicians.

The study also showed that:

Eighty-eight per cent of the population believe the right to see the same doctor regularly is of vital importance.

Eighty-nine per cent believe that medical care in this country has improved over the past twenty years. Half of these persons ascribe the improvement to more and better research and advances in medical science.

Seventy-six per cent of the people said they wanted to choose their own physicians; 13 per cent saw no difference in whether they or someone else chooses their physician; 8 per cent preferred to have someone else choose, and 3 per cent had no opinion.

In answering to further questioning, 93 per cent of those surveyed believed that free choice would give them more confidence in the doctor, 84 per cent thought doctors would take a more personal interest in them, and 79 per cent believed they would have less trouble getting the doctor to make a home call.

Concerning the right to see the same physician all the time, 88 per cent considered this right to be very important. Of the 12 per cent who did not believe such continuity to be of vital importance, 8 per cent saw no difference in whether or not they saw the same doctor every time, and 4 per cent gave other comments.

In answering still another set of questions, 93 per cent believed such continuity would give them more confidence in the doctor; 92 per cent thought doctors would take a more personal interest in them; and 84 per cent believed they would have less trouble getting a doctor to make a house call.

When queried about the main advantages of a regular doctor, those interviewed gave a variety of reasons. Sixty-two per cent cited the physician's knowledge of their medical history. They said, "He knows your system inside and out from dealing with you regularly; he knows what you've had."

Also mentioned by 30 per cent was reliability on emergency calls; confidence in the physician by 21 per cent; and a closer relationship between doctor and patient by 18 per cent.

Concerning the payment of medical bills, a total of 79 per cent wanted to assume all or part of the responsibility for paying their doctor bills either by direct payment or by paying part of insurance premiums.

AMA APPROVES AGED HEALTH INSURANCE PLAN

The AMA House of Delegates, during its recent Clinical Meeting in Minneapolis, accepted a recommendation of the council on medical service to provide low-cost voluntary health insurance for all persons over sixty-five with low income and resources. This action also had the approval of the AMA Board of Trustees. According to the plan, physicians would be urged to charge lower fees for such persons in order that they may obtain voluntary health insurance at reduced cost. Copies of the action will be distributed to medical society approved plans including Blue Shield and private insurance programs requesting their co-operation. This action will be taken in order to get the plan into effect as early as possible. Physicians under the low cost health plan would agree to accept lower fees from persons over sixty-five and on low income levels. Dr. Robert L. Novy of Detroit, Council member, pointed out that the plan contemplates a scale of graduated fees, dropping at some predetermined income point. The resolution does not fix such a cutoff.

Dr. Novy said some Blue Shield plans now offer such policies at local levels, but that Council members believed they should be adopted nationally. He called the resolution a recognition by physicians that the problem is their responsibility and that they are willing to do something about it.

"We believe this is a field where the government will act if the doctors don't," Dr. Novy said.

INSURANCE HEAD VOICES OBJECTION TO AGED INSURANCE RATE REDUCTION

Dr. Harry E. Ungerleider, Director of medical research for the Equitable Life Assurance Society of New York, in a recent address to the Association of Minnesota Internists, termed any plans to give certain age groups lower insurance rates "ridiculous." The leading medical insurance man pointed out that there is no "equity" in singling out one segment of population to be supported by the rest. Dr. Ungerleider, in making his remarks, referred to recent action of the AMA House of Delegates at its Clinical Meeting in Minneapolis, which asked for lower insurance rates for persons over sixty-five and for lower fees charged by doctors for those patients. "Somebody has to pay for this, why should doctors or any other group be singled out to subsidize others?" questioned Dr. Ungerleider. According to Dr. Ungerleider, the percentage of persons over sixty-five will hit near 35 per cent by 1980, and something will have to be done to provide extra medical care needed by this age group. Rather than special plans, Dr. Ungerleider favors adoption of a program comparable to that used by life insurance companies. Under such a plan, persons in their working years—twenty-five to sixty-five—should pay insurance rates that would carry them through the rest of their lives. He pointed out the "inequity" of the AMA proposal by commenting that if any part of the population really needs special attention, it is the newly married couple going through their first pregnancy.

Dr. Ungerleider told the Minnesota Internist

group that he was in favor of major medical insurance— deductible policies under which the patient pays part and the insurance company the rest of really high cost medical bills. The programs favored by Dr. Ungerleider would include provisions for determining the "deductible" figure by income and leave out "fee schedules," permitting the doctor to order done what he feels necessary with customary charges.

MEDICAL COST RISING WHILE PRICE INDEX HOLDS FIRM

For the second consecutive month, the consumer price index in United States cities remained the same in October. However, the medical care category continued its upward spiral. The latter showed a 0.4 per cent rise to 146.7 over the previous month and 5 per cent higher than the index for October, 1957 (1947-1949 = 100). The Bureau of Labor Statistics explained that group hospitalization insurance plans advanced in some cities and fees for professional services were higher. A slight increase in the price of prescriptions was also indicated.

PHYSICIANS WARNED TO STOP ABUSING INSURANCE

American physicians were recently urged to crack down on those who are playing medical care insurance for a good thing, or face the possibility of disciplinary action from the government. This, in effect, was the warning which came recently from George Bugbee, President of the Health Information Foundation, in an address before the annual scientific assembly luncheon of the Washington, D. C., Medical Society. He pointed out that the rise of prepaid health and hospitalization insurance has been accompanied by a certain amount of fee-bloating and over-usage of services and facilities. According to Mr. Bugbee, doctors and hospitals "must demonstrate to the public that the problems of over-use and excessive cost can be controlled" if growth of insurance is not to be retarded. Said Mr. Bugbee:

"I believe the time has come for these groups to coordinate and work out the necessary administrative structure to demonstrate to the public that the small percentage from their ranks who create these problems can be controlled.

"Without such demonstration, I am sure that pressure for government intervention in the financing and control of physicians and others in the health field will increase. We have already seen much government interest in some of these areas. If criticisms on these points become much greater, I believe government action is inevitable."

NEW INSURANCE CLAIM FORMS SIMPLIFIED

The Health Insurance Council reports that new simplified claim forms for accident and health insurance policies are being issued by insurance companies. A guide for physicians on the use of these new forms has been published by the Health Insurance Council. In the near future, a copy of this guide will be mailed from the Executive Offices to all members of the Minnesota State Medical Association. This service is made possible through the co-operation of the Health Insurance Council. It is entitled, "Simplified Claim Forms for Accident and Health Insurance—A Report to the Physicians."

The manual describes the principles of the Council program to reduce paper work for doctors and at the same time to provide insurance companies with the medical information they need to process and pay claims.

Ralph T. Heller, chairman of the Uniform Forms Committee and Second Vice President of the Prudential Insurance Company of America, describes the report as a supplement to a booklet distributed among insurance companies last year urging their adoption of the new forms.

"The response of the insurance business to the report to companies has been most gratifying," declared Mr. Heller. "A steady growing number of insurance companies across the country has adopted the simplified claim forms and others have made definite plans to do so. Now we want to tell our story to the nation's doctors, so that they may be better aware of what is being done to reduce the burden of their paper work and thereby better serve their insured patients."

Replacing a great variety of claim forms from hundreds of companies, the Health Insurance Council forms consist of two basic attending physicians' statements—one for group accident and health insurance, and the other for individual and family health policies. They are to be used solely in connection with accident and health insurance claims.

The forms comprise a standard set of questions, in a standard sequence, which are the minimum required to meet the provisions of most insurance companies. Some questions and phrases are optional and in many instances will not be required or

used by companies. The questions used, however, will be sufficient to provide the information needed to process routine claims of all types, including initial and continuing proof of disability as well as surgical and medical claims information.

JUST WHAT THE DOCTOR ORDERED?

The *Washington Stethoscope,* one of the several newsletters reflecting trends, news and views significant to the medical profession, recently reported the following account of Minnesota's Senator Hubert Humphrey's visit with Khrushchev.

"Some aspects of medical practice by American physicians may soon feel impact of a Western Senator's recent eight-hour session with Khrushchev.

"Political and military significance of Senator Hubert H. Humphrey's meeting with the Soviet chief has been played up in the press since his return home this week. Scant notice has been given fact that a *medical mission* sent him abroad in the first place and actually served as the vehicle for his historic visit to the Kremlin.

"Senator Humphrey went to Europe as chairman of a Congressional committee specifically directed 'to make a complete study of any and all matters pertaining to international health, research, rehabilitation and assistance programs.'

"The committee is scheduled to make its report to the Senate by Jan. 31, although it is not unlikely a time extension will be asked for and granted. That the report will recommend increased exchange of Russian and U. S. physicians and medical students and wider distribution of information in this country on Soviet clinical practices is all but certain, based on Senator Humphrey's disclosure this week.

"The Minnesota Democrat, who is proud he started out as a pharmacist, has exercised influence on national health legislation even though foreign affairs and agriculture are his main concerns. His stature heightened by the Moscow talks, Humphrey's words and views in 1959 on medical resources of U. S. will carry more weight than ever."

TECHNICAL AID URGED FOR HUNGRY NATIONS

Dr. G. Henry Sebrell, Jr., director of Columbia University's Institute of Nutrition Sciences, said in New York that he believes hungry nations of the world need technical assistance to combat malnutrition more than they need shipments of surplus food from the United States.

He said at a luncheon of Columbia Associates that surplus food shipments may stifle agricultural advances in underdeveloped countries. He believes that America should "help hungry people to feed themselves adequately within their own resources."—*AMA News*

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

MINNEAPOLIS MACHINIST SENTENCED TO SERVE THREE YEARS ON ABORTION CHARGE

On September 26, 1958, Elmer C. Hultgren, fifty years of age, 123 W. 26th Street, Minneapolis, was sentenced by the Hon. John A. Weeks, Judge of the District Court of Hennepin County, to serve a term of three years in the State Prison at Stillwater pursuant to his plea of guilty to an abortion charge previously entered before Judge Weeks on August 8, 1958. Before being sentenced by the Court, the defendant entered a plea of guilty to an information charging him with having a prior conviction for a felony. On May 17, 1946, Hultgren had been convicted of the crime of abortion in Hennepin County District Court at which time he was sentenced by Judge Lars O. Rue to a term of not to exceed four years in the State Prison, the execution of the sentence being stayed and the defendant placed on probation on condition that he serve the first year of his sentence in the Minneapolis Workhouse.

A representative of the Minnesota State Board of Medical Examiners signed a criminal complaint against the defendant in the present case after an investigation disclosed that he had aborted a St. Paul divorcee in June, 1957, for which he was paid the sum of $650.00, and that he had on three separate occasions in June, 1958, attempted to abort the same woman by the use of ergot, quinine tablets and a catheter. The woman also stated that although she had paid Hultgren nothing in 1958, he had made a charge of $300.00 for his services. When the defendant was arrested he had in his possession a satchel of the type used by physicians which contained among other things, 9 catheters and wires, a speculum, one forceps, sterile lubricant, penicillin, quinine, a roll of absorbent gauze and four one-ounce bottles of castor oil. Hultgren admitted that he had been performing abortions for a year prior to his arrest, the number of illegal operations performed by him during that time being approximately ten.

Hultgren, who has been employed as a machinist for many years by a Minneapolis concern, has another previous conviction, for practicing healing without a basic science certificate. On October 17, 1944, he was sentenced in Hennepin County District Court to a term of one year in the Minneapolis Workhouse but due to the fact that he was at that time employed in an essential job in a Minneapolis war industry, he was required to serve only two months of that sentence. Hultgren was born in Chicago and has lived in Minneapolis for forty-two years. He has no medical training of any kind but on one occasion while being questioned under oath Hultgren claimed that a convicted abortionist was the person who first instructed him in the performing of abortions.

The people aged sixty-five and over in the United States have been growing rapidly in number, and the outlook is that they will continue to increase markedly in the years ahead. Their total has grown by almost 5.4 million, or by 60 per cent, between the 1940 census and mid-1956. During this period of little more than sixteen years, the number of elders rose from 9.0 million to approximately 14.4 million, and their ratio to the total population increased from 6.8 to 8.6 per cent.—*Statistical Bulletin,* Metropolitan Life Insurance Company, March, 1958.

The Art of Medicine

PR

Carl H. Woyke, B.A.
Editor

AMA WARNS PUBLIC OF FOOD FADDISM DANGERS

Food faddism is spreading with an alarming speed throughout the country, and the AMA is joining with the Food and Drug Administration and the National Better Business Bureau in a concerted program to inform the public of its dangers. We urge you to join in an educational campaign aimed at exposing this multi-million dollar racket which is costing some 10,000,000 Americans over $500,000,000 each year. The AMA points out that this program is important to the entire medical profession because these pseudo-authorities on nutrition are operating on a national scale with their peddlers and advertisements. Although many of these products contain harmless ingredients, they have become a menace to the public when their promoters make extravagant claims for their healing powers. Needless to say, the buyer who relies on vitamin-mineral concentrates and seaweed-cereal mixtures to cure unidentified ailments may face tragic results.

AMA Aids: For use of state and local societies in this campaign, the American Medical Association has produced a series of educational aids. All can be ordered from the Minnesota State Medical Association, 496 Lowry Medical Arts Building, St. Paul 2, Minnesota.

"The Merchants of Menace"—Eight-page, two-color pamphlet, outlining the dangers of food faddism. Available in quantities without charge, for distribution with monthly statements. Sample copies were included with the December Newsletter.

"Let 'Em Eat Hay"—By Joseph N. Bell—Reprint of an article in September, 1958, issue of **Today's Health,** presenting a comprehensive review of food quackery and nutrition "nonsense." Available in limited quantities for the waiting room reading rack.

"The Medicine Man"—Twenty-seven minute, black and white motion picture, produced in Hollywood especially for this campaign. Available for showing on television and to community groups. Available directly from the Communications Division, American Medical Association, 535 No. Dearborn, Chicago 10, Illinois.

WHOM DO YOU KNOW?

It's "whom you know" rather than "what you know" that often leads to a successful program of grass roots persuasion, a panel of medical society representatives concluded at a recent AMA Public Relations Institute session.

The key to effective persuasion, they agreed, is to know and be known on a first-name basis by the public opinion leaders in the state and community. Among these leaders are elected and appointed public officials; officers of business, industry and utility firms; key association executives; members of the communications industry; religious personages, and political party officials.

Aubrey Gates, Director of AMA's Field Service Division, who moderated the panel, said it is equally important for opinion leaders to know you. "They should be aware of your personality, your feelings and your sympathies," he said.

To dramatize the panel's "Whom Do You Know?" theme, pictures of seventeen prominent persons were flashed on a screen and the audience was asked to identify each. With the exception of such prominent personalities as Presi-

dent Eisenhower and AMA's Executive Vice President, Dr. F. J. L. Blasingame, audience identification was poor.

To overcome deficiencies in identifying key people the panel offered the following suggestions:

1. Keep a card file on every opinion leader in your state and community.
2. Get to know these leaders personally.
3. Make as many friends as possible.
4. Meet your public officials at the beginning of their careers.
5. Work closely with congressmen and members of the state legislature.
6. Keep abreast of legislative action on the national, state and local levels. Let your feelings be known on these issues.
7. Be a positive member of your community and lend your support to various civic programs.

MEDICAL ASSISTANTS RECEIVE PUBLIC RELATIONS TRAINING COURSE

There's a tremendous amount of "public relations" transacted by the girl at the doctor's reception desk, so any investment in her public relations education is well worth a medical society's money.

Doctor-patient relationships in Oneida, Herkimer and Madison counties in New York, should show a marked improvement now that 200 medical assistants from that area have completed a training course sponsored by the three county societies. The course was held one night a week for a month and included eight classes on poise, medical public relations, insurance, Medicare and office procedure. Instructors were drawn from a variety of sources inside and out of the medical profession. An airline stewardess briefed the group on grooming, a telephone company representative talked on telephone tips, and a member of the Workman's Compensation Board discused handling of eligible patients.

"DOCTOR'S HOUSE CALL" GETS NEW AND MORE TIME

The new radio series inaugurated on WCCO radio during the fall of 1958, is experiencing growing pains. Originally five minutes in length, the program time has been increased to ten minutes and is now heard Monday through Friday, from 6:30-6:40 p.m. on WCCO radio, 830 KC, Minneapolis.

"Doctor's House Call" features Dr. James Rogers Fox and his informal but informative presentation of health topics. "Your Health" is now heard each Sunday morning from 8:05 to 8:15 a.m.

"DOCTOR, TELL ME" COVERAGE AT NEW HIGH

The Minnesota State Medical Association produced program, "Doctor, Tell Me," is now heard on twenty-five radio stations throughout the state of Minnesota. In addition to Dr. James Rogers Fox, the fifteen minute weekly program features guests, Miss Audrey June Booth and Jerry Ball of the KUOM staff. Format of the series includes "Medical Facts & Fallacies" treatment, letters from the mailbag, and question and answer sessions.

YOU CAN HELP

Bring the information about these popular health education projects to the attention of your patients and community. Signs, placards, or display notices in local newspapers which give the time and date of "Doctor, Tell Me" broadcasts on the radio station in your area, might be a project worthy of consideration by county medical societies.

(See schedule of programs in December issue, Page A-54)

Public Health

UNIT FOR RECALCITRANT TUBERCULOSIS PATIENTS ANOKA STATE HOSPITAL

D. S. FLEMING, M.D.

The purpose of the Recalcitrant Unit at the Anoka State Hospital, in the words of the January 19, 1955, report of the Tuberculosis Facilities Commission, is to afford security, care, and treatment for "irresponsible people with active tuberculosis . . . originating from whatever source within the State of Minnesota." It is expected, however, that this 24-bed unit will not be adequate to accommodate every troublesome patient from the various sanatoria and other public hospitals and institutions. Therefore, the superintendent of the Anoka State Hospital, by delegation from the Commissioner of Public Welfare, must exercise judgment and discretion in approving admission of patients to this unit.

General

The following facts are taken from appropriate laws (Minn. Stat., Secs., 144.42 through 144.424):

1. A recalcitrant patient is defined as a patient infected with tuberculosis in the infectious stage who by his conduct or mode of living endangers the health and well-being of his family or other persons.
2. Cases of tuberculosis are reportable to the State Board of Health within 7 days after the date of diagnosis.
3. Any health officer who has knowledge of a recalcitrant patient may report this to the board of county commissioners.
4. If this board makes a finding that the patient is recalcitrant, it may, by resolution, direct that the patient be committed to the tuberculosis sanatorium or public hospital.
5. There is provision for appeal to district court both by the patient and by the health officer in the event that the findings of the county commissioners are unacceptable to either.
6. If the patient refuses to enter such institution, the resolution shall be filed with the clerk of district court.
7. The judge of this court shall order the apprehension of the patient and his deliverance to the designated institution.
8. If, upon appeal, the court finds that the patient is recalcitrant, the court will either commit the patient in the manner described above or, with the consent of the Commissioner of Welfare, may order the patient confined at the Tuberculosis Unit at Anoka State Hospital until such time as the Commissioner finds that the patient may be safely cared for at the sanatorium or hospital named by the court or can be discharged. The patient may be readmitted to Anoka by the Commissioner at any time during the remainder of the patient's hospitalization. There is nothing in the law prohibiting the court from making a dual commitment to the sanatorium or other public hospital and, with the consent of the Commissioner, to the Recalcitrant Tuberculosis Unit, Anoka State Hospital. Operationally, such dual commitment would take the least of the court's time and would facilitate transfer back and forth between the Recalcitrant Unit and the parent institution, as dictated by the bed situation, the degree of recalcitrance, and other variables.
9. Any health officer may make his initial petition for commitment of the recalcitrant patient directly to the district court.
10. Any patient entering any public sanatorium or hospital for the treatment of tuberculosis is subject to the regulations of that hospital. A patient who repeatedly violates such regulations or attempts or threatens to leave the institution without consent may be confined in quarters apart from the other patients or may be brought before the court for commitment as a public health menace, and in such case the superintendent or chief medical officer of the institution shall occupy the position of health officer.
11. A patient committed as recalcitrant may, no oftener than every six months, petition the district court for an order directing his release.
12. Any patient committed to a sanatorium or hospital who willfully violates regulations or leaves without consent may be brought before the commiting court by the superintendent; and the court may, with the consent of the Commissioner of Public Welfare, amend its commitment order, ordering the patient to be confined in the Tuberculosis Unit at Anoka State Hospital.

Admission Policy

1. The general policy will be that transfer will be made to the Recalcitrant Unit, Anoka State Hospital, only when such transfer either from the public health security or the medical point of view, will produce beneficial effects considerably

beyond the capabilities of the parent institution and with the proviso that the patient will be returned to the parent institution as soon as it is believed that the beneficial results have been attained.

2. The Commissioner of Public Welfare has delegated to the Superintendent of the Anoka State Hospital the exercise of his authority to give consent for admission to the Anoka State Hospital Tuberculosis Unit and the authority to return the patient to the parent institution. Direct communications among the State Sanatorium, public hospitals, the courts, and the Superintendent of Anoka State Hospital is authorized in these matters. A copy of such communications should be sent to the Commissioner, Attention: Medical Director.

3. The rate charged the counties for patients in the Recalcitrant Unit shall be the same rate that is charged for the care of tuberculosis patients at the Minnesota State Sanatorium.

Procedure

1. Public health officers, and superintendents or medical directors of the state and county sanatoria and other public hospitals, should take the necessary steps leading to the commitment of recalcitrant patients under their cognizance to the proper hospitals for the treatment of tuberculosis and dually to the Recalcitrant Tuberculosis Unit, Anoka State Hospital.

2. Such of those patients so committed who are so recalcitrant that they cannot be treated in a facility other than the Anoka Recalcitrant Unit may be reported to the Superintendent, Anoka State Hospital, with request for admission to the Tuberculosis Unit. Transfer of such patients will be effected dependent upon the space capabilities of Anoka.

3. Patients from state institutions operated by the Department of Public Welfare will be similarly reported; and transfer to Anoka State Hospital will be on the determination that Anoka State Hospital, by virtue of its special medical facilities, can enhance the treatment of tuberculosis in the particular patient.

4. As such time as it is deemed that the recalcitrant patient at Anoka may be amenable to treatment at the parent institution, he will be returned to that institution. If at all practicable, he will be returned to the parent institution in sufficient time to allow for discharge planning.

5. At such time as a patient in the Recalcitrant Unit at Anoka is considered as no longer recalcitrant by virtue of his reaching a noninfectious state, he will, upon his request, be released from the hospital whether or not it might be to his general medical benefit to remain hospitalized longer.

MINNESOTA STATE BOARD OF HEALTH REGULATIONS IN RELATION TO IONIZING RADIATION

The attention of all physicians in Minnesota is directed to the following discussion and the parts of a series of regulations adopted by the Minnesota State Board of Health on December 4, 1958, and filed with the Secretary of State on December 18, 1958. It should be specifically noted that these regulations have the force of law, and "Nothing in these regulations is to be construed to limit the kind and amount of radiation that may be intentionally applied to a person for diagnostic or therapeutic purposes by or under the direction of a licensed practitioner of the healing arts."

Of immediate significance to the medical profession in the regulations is a section which requires the registration of all sources of ionizing radiation with the Board of Health during the month of March, 1959. Sources of ionizing radiation include all diagnostic and therapeutic X-ray machines in hospitals, clinics, private offices, or at any other location within the State. Registration forms to be completed by "every person or institution who owns, controls or operates, directly or indirectly, any radiation source in this State" are available by writing or calling the Section of Radiation and Occupational Health, Minnesota Department of Health, University Campus, Minneapolis 14, Minnesota. By means of this registration the Minnesota Department of Health will develop and maintain an inventory of radiation sources.

Regulation 1153 (Registration) states specifically:

(a) Except as otherwise specifically exempted in these regulations, every radiation source shall be registered during the month of March, 1959, with the Board of Health upon forms prescribed and provided for that purpose. . . .

(c) The form for registration shall require, and the registrant shall furnish, the following information:
  (1) The name and address of the owner of the source.
  (2) The name and address of the person in charge of radiation safety in the installation, and a statement as to his qualifications for performing this work.
  (3) A description of the type and size of the radiation source.
  (4) The location of the radiation source.
  (5) A general description of measures taken to safeguard the health of all personnel and of the general public in regard to the use of these radiation sources.

The Board may also require such other information as it may deem relevant.

(g) The registration of any radiation source . . . shall not imply the approval by the Board of Health of the . . . operation . . . of such radiation source, but shall serve merely as notice to the Board of Health of the facts stated in such registration. . . .

Regulation 1154, relating to investigations, states, "any person in control of any radiation source in this State, upon request by any member of the Board of Health or any agent of the Board of Health duly authorized by it for this purpose, shall permit such member or agent to inspect any such radiation source and the place and premises upon and within which such radiation source is located, . . ."

Regulation 1160, relating to responsibilities, states that:

(a) Every person who owns or controls any radiation source subject to these regulations shall ensure that such radiation source is used only under the direction of a competent person who is responsible for the radiation safety therein, and whose name has been reported to the Board of Health. . . .

(b) The person in charge of the radiation safety in the installation shall have the following responsibilities:

(1) He shall inform himself of the hazards attendant upon the presence of radiation in the installation and, if necessary to this end, obtain the services of a qualified expert.

(2) He shall provide, . . . , any necessary instruction concerning the attendant radiation hazards and safe working practices to all employees whose duties necessitate . . . the operation of any machines that produce radiation in amount that leads to hazard.

(5) He shall ensure beyond reasonable doubt that any area, inside or outside the installation, normally occupied by adults not primarily engaged in radiation or associated work cannot be subjected to radiation levels exceeding the appropriate limits.

Other sections of the regulations, less applicable to the medical profession, prohibit the use of shoe-fitting fluoroscopes in Minnesota, require that plans for radiological safety programs for any nuclear reactor or facility must be submitted to the Board of Health for approval before construction commences, and stipulate that nuclear accidents must be reported promptly to the Board.

Having a baby is not only safer today for both mother and child than it was 25 years ago, but measured in equal dollars, it is also about 18 per cent less expensive, according to Health Information Foundation.

MINNESOTANS URGED TO WATCH FOR CASHEW NUTSHELL NOVELTIES

Minnesotans are urged to be on the lookout for novelties carved from cashew nutshells. The latest report to the Minnesota Department of Health from the United States Public Health Service indicates that these so-called voodoo doll heads have been used as decorations on children's straw slippers. A shipment was recently discovered in a large Cincinnati department store. Previously, use of the doll heads had been reported on such novelties as beverage swizzle sticks.

The cashew nutshell can have harmful effects on persons handling it. It contains a chemical similar to the oil in poison ivy and persons who handle it can develop blistering skin reactions. In addition, eyes of the doll are made of jequirity beans which could cause a serious or even fatal illness if swallowed by a baby.

It is believed that a great number of these novelties have been sold in this country, and it is now known that they have been marketed in Minnesota, according to Dr. R. N. Barr, State Health Officer.

The dolls are imports from Haiti. Only dolls carved from cashew nutshells are involved. Dolls from coffee beans do not cause trouble. The cashew nutshell is kidney shaped, an inch or more long, and about three-fourths inch wide. Coffee beans are much smaller. The jequirity bean is about the size of a small pea, and is essentially red or orange with a variable area of black.

NURSING GRANTS TOTAL $6 MILLION

The Public Health Service will award $6 million this year to colleges and universities for grants to registered nurses for advanced preparation in administration, supervision of nursing service, and teaching methods.

About 1,500 registered nurses will benefit from these grants, Dr. Leroy E. Burney, surgeon general of the service said.

The appropriation by Congress for the Professional Nurse Traineeship Program was doubled for fiscal 1959.

A limited number of traineeships will be given to nurses now enrolled in baccalaureate programs in nursing.

Thirty-nine additional schools are being offered traineeship funds this year, bringing the total number of schools to 99.

At a national conference in Chicago in August, nursing and health leaders recommended that the program, authorized by Congress for three years in Health Amendment Act of 1956, be continued at least five more years.—*AMA News*

History of Medicine in Minnesota

A MEDICAL HISTORY OF MEEKER COUNTY PRIOR TO 1900

HAROLD E. WILMOT, M.D.

Litchfield, Minnesota

(Continued from October, 1958, issue)

Dr. Charles A. McCollom was Dassel's first physician, arriving there in 1871 and selling his practice to Dr. J. F. Kauffman of Newburg, Pennsylvania, for $250.00 on December 1, 1887. He then moved to Minneapolis.

He was a graduate of Rush Medical College in 1868; his Minnesota Medical License No. 797 was granted February 6, 1884. A regular, he was listed in the directories since 1890 as residing in Minneapolis. He was reported by the American Medical Association as having been born in Binghamton, New York, on July 2, 1847. He was licensed in California in 1918, and died at Pasadena, California, January 22, 1926. He was formerly connected with the Medical Department of Hamline University.

Dr. Karl Danielson states: "He was a sincere Christian and was active in the religious, social, and civic life of the community. He served as village recorder of Dassel and as County Commissioner of Meeker county from 1878 to 1880. He bought and ran a drugstore in Dassel in 1880, which he sold to Mr. Rudberg in 1883.

Litchfield Ledger, August 28, 1873—(Dassel News). "Dr. McCollom is busy erecting a new office and in a short time will, in company with a Mr. Bell, start a drug store here."

News Ledger, January 8, 1879—"Dr. McCollom of Dassel is chairman of the Meeker county Board of Commissioners this year."

News Ledger, August 22, 1881—"Dr. McCollom was one of four delegates from Meeker county to the Minnesota State Republican Convention."

News Ledger, March 20, 1884—"Dr. C. A. McCollom of Dassel is the secretary of the Pension Board of this local district." (Drs. Bissel of Litchfield and Kee Wakefield of Hutchinson were the other members.)

News Ledger, July 22, 1886—"Dr. McCollom of Dassel was appointed by Gov. Hubbard as one of the delegates to the National Conference of Charities held in St. Paul, and he attended that gathering last week."

Independent, December 10, 1886—(Dassel News). "Dr. Charles A. McCollom is about selling out preparatory to moving to Minneapolis. He will leave a large practice and many will regret his departure. It will be an opening for someone well qualified to treat those in need of medical skill."

Dr. McCollom did move to Minneapolis as before noted and conducted his office in the Masonic Temple building at Sixth Street and Hennepin, with his residence on Sixth Avenue North. In 1890 he became Medical Director for the Modern Woodmen of Minnesota and held this position for a number of years. He retired from practice (?) in 1918 and moved with his family to Carmel, California, which became their future home.

Dr. Edward J. Brown of the Minnesota State Board of Health in his "Reminiscences" published in 1925 and 1926 is quoted: "Visiting Dassel November 12,

1884, he found Dr. C. A. McCollom there. He was a former member of the Hennepin County Medical Society and later returned to Minneapolis and was at one time president of the Hennepin County Medical Society. Dr. McCollom died within the past year at Los Angeles.

"At Dassel, they hunted strenuously, and with some success, for cases of variola. It was a cold day and they were obliged to satisfy their hunger by eating raw turnips, as preferable to the opportunities we met at the houses on the route. The excellent oyster stew served by his good wife in the evening was some recompense."

There were similar news items of Dr. McCollom's medical and surgical treatments mentioned in local news columns, and they also mentioned how well he had done generally and the great disappointment in losing him to Minneapolis (as indeed it was).

Dr. Elam Stiles Gibbs was a practitioner of the regular school and apparently was induced to come to Litchfield to assist Dr. V. P. Kennedy during the years 1872-73, as we find their professional card together in the newspapers of that year. He came from Glencoe (McLeod County). No doubt, Dr. Kennedy tried to obtain an assistant to handle his practice during his frequent absences. There is some confusion as to just what happened, but I would believe from the following newspaper reports that he separated from Dr. Kennedy in 1873 and practiced independently in Litchfield until about 1880, when he moved to Monticello, Minnesota.

News Ledger, January 1, 1874—"Dr. E. S. Gibbs, formerly of Glencoe, has removed his family to Litchfield." [In another column we give what the *Register* (Glencoe) has to say about his leaving that place.] "In our small acquaintance thus far, we find him a gentleman and a first class physician."

A paragraph from the *Glencoe Register* expressed extreme regrets at his leaving.

News Ledger, May 20, 1875—"Dr. E. S. Gibbs has a card in another column. Doc. is ready night and day for all who may call on him."

Independent, August 3, 1886—"Dr. E. S. Gibbs, formerly a resident of this city but now residing at Monticello, is a brother of candidate for governor, Gibbs."

Transactions of Minnesota Medical Society list Elam Stiles Gibbs as having been graduated from Charity Hospital Medical College, Cleveland, Ohio, 1869, and receiving Minnesota Medical License No. 131, October 12, 1883. They listed him in Glencoe in 1872. He was reported by the Minnesota Historical Society as practicing in Monticello in 1883. They also reported that Polk's Directory of 1900 listed an E. S. Gibbs at Minneapolis. Our directories list him at Monticello from 1890 to 1909, and the A.M.A. Directory of 1927 listed him there.

The death certificate stated he was born May 1, 1847, in Pennsylvania and died August 3, 1922, when seventy-six years of age, at Monticello, Minnesota, from a cerebral hemorrhage. Burial was at Geneva, Minnesota; information given by Martha Gibbs, and certificate signed by F. E. Ellison, M.D.

The medical history of Freeborn county, Minnesota, lists an E. *M.* Gibbs born at Rome, Bradford county, Pennsylvania, in 1847. He read medicine with Dr. A. C. Wedge. Dr. Wedge reported for him a case of Cesarean Section performed in that neighborhood by an old woman. His graduation college and date is correct, and he practiced in Geneva, Freeborn county, one year, evidently moving from there to Glencoe and later Litchfield and then Monticello as outlined here. His middle initial must have been erroneously read from an "S" to an "M" in Freeborn county files.

Dr. James S. Gibson (regular) located in Atwater, Minnesota, one mile west of Meeker county's boundary about October 15, 1873, having left New London, Minnesota, at that time. He is listed here because from the beginning Atwater physicians have attended many patients in our county.

There are many excerpts in the regional news columns of his having attended patients for various illnesses, as we find concerning other doctors, but in some manner Dr. Gibson's cases revealed the most gruesome details of any I have read.

The last recorded news item in our local papers was August 21, 1881, which may or may not mean he ceased practicing about that time. Perhaps the Kandiyohi county historians will uncover further pointers. Minnesota medical directories give us the following:

James S. Gibson was born in Ayr, Ontario, November 9, 1842. He came with his parents to Minnesota in 1853. He graduated from Chicago Medical College in 1869. He possessed Minnesota Medical License No. 319, issued November 12, 1883, and his address was listed as Atwater in 1890 and 1909.

Word of mouth has it that he was a fine country doctor, well liked and had many thrilling experiences with early transportation, the elements, and even wolves.

Dr. C. L. Armington.—I believe his story is well contained in the following squibbs:

News Ledger, January 1875—"Dr. C. L. Armington of Minneapolis called on us Tuesday last. The doctor is hunting up a location and comes well recommended."

News Ledger, February 11, 1875—"Dr. Armington has located in this village. He boards at McCarey's, south side of the tracks. He is said to be an excellent physician."

News Ledger, July 8, 1875—"Mrs. Hayford has been suffering with a severe attack of erysipelas in the face and eyes which made her blind for some time, but under the skillful care of Dr. Armington is getting better fast."

News Ledger, September 26, 1875—"Dr. Armington left here on Tuesday for Terre Haute, Indiana, where he purposes to reside and fight chills and fever for the remainder of his natural life. Doc. says he loves Minnesota, but it is too healthy for his business."

Dr. Lysander P. Foster, a homeopathic physician, located in Litchfield in May, 1875. The *News Ledger* states: "He has purchased the old schoolhouse and is fixing it up for a residence." A. C. Smith's *History of Meeker County* lists him as one of the physicians of Litchfield in 1876.

Transcripts of Medical Society of Minnesota give this information:

Graduated, Hahnemann Medical College of Chicago, 1882; Minnesota Medical License No. 131, October 12, 1883. Recorded address: 1890, Minneapolis. He apparently left Litchfield within a few years. Dr. Rosenthal records his death at eighty-eight years of senility on April 7, 1924.

Dr. C. J. Erickson.—We have previously read his letter in the local *News Ledger* in response to one from Dr. V. P. Kennedy in regard to his license to practice the healing art.

News Ledger, March 30, 1882—"Dr. Erickson of Grove City has sold out his Scandinavian paper to some young men who have been in his employ for a year or two past."

Independent, June 17, 1884—(Grove City News). "Dr. C. J. Erickson, former resident of this place, has now located in Minneapolis where he intends to practice his profession as a doctor. It is claimed that the doctor has reformed and become a good Christian and missionary. The latter statement is very doubtful, and is one of the biggest wonders of the nineteenth century, if true."

Dr. Charles Weinsma.—

News Ledger, June 6, 1877—"Dr. Weinsma, a young man who has lately located as a practicing physician at Forest City, publishes a card to that effect in another column of this issue."

"C. Weinsma
Physician and Surgeon
Office at J. B. Atkinsons, Forest City"

News Ledger, October 31, 1878—"Dr. C. Weinsma, who has been located at Forest City for the past year and a half has moved to Litchfield."

News Ledger, February 20, 1879—"Dr. Weinsma published his directions for healing colds."

News Ledger, June 5, 1879—"All For a Dog."

"Vick Weems and Dr. Weinsma had a slight difficulty over a dog. Some choice language was indulged in, when ye mighty doctor smote the vanquished Victor on the shoulder. Vick had him brought up before Judge Atkinson, and the Dr. was fined $5.00 and costs, the whole amounting to $13.95. The Doc not having the wherewithal to pay the same, a commitment was placed in the hands of Officer Hooser. W. W. Rollins came to his rescue, rather than see him go to jail. He now wishes he hadn't been quite so kind-hearted, as the doctor forgot to fix the matter up with him before he started for foreign parts.'

Independent, December 22, 1885—"Dr. Weinsma, several years ago a resident practitioner in this city who left town rather suddenly (so much so in fact that he forgot to pay sundry bills), is now one of the leading physicians of Wheaton, Dakota Territory, and coroner of Richland county. His friends here will be glad to hear that he is prospering."

Transcripts from Minnesota Medical Association: "Weinsma, Charles; graduate of University of Utrecht, Holland, 1872; Minnesota Medical License No. 963, September, 1884; Regular." From Minnesota Directories: 1890—Winona, 1895—Bellingham; Deceased—Place of death was evidently Bellingham, but date is not given. No record in A.M.A.

Dr. James Fair probably practiced part-time in Paynesville (Stearns county) and Manannah (Meeker county). According to an "old settler," he had his office in the Manannah hotel in the 1880's and "went to Paynesville and died there."

[At this time, lumbering, milling, the stagecoach and the buzz of settlement made this village (Manannah) on the banks of the Crow River in the northern part of the county, a center.—Ed.]

News Ledger, June 19, 1879—"The oldest son of J. D. Amos has been dangerously ill the past week but is now recovering fast under care of Dr. Fair."

News Ledger, January 13, 1881—"Dr. Fair treated the Manannah school teacher."

News Ledger, December 22, 1881—"Dr. Fair is busy vaccinating the school children of this village."

News Ledger, June 8, 1882—"Dr. Fair is doing a lively business. We saw him smiling this morning, something is up."

News Ledger, July 13, 1882—"Dr. Fair, formerly of Manannah, has moved to Paynesville, so we are told."

News Ledger, February 29, 1884—"Drs. Spencer and Fair are healing the sick as usual."

Independent, August 23, 1884—"Dr. Fair testified in re a gunshot wound received by Owen Gibney in neck and back by his father. He is a practicing physician residing (sic?) in Manannah."

Independent, March 23, 1886—"Dr. Fair attended Shaughnessy with Dr. Newlands of Litchfield and amputated his left arm which was shattered by goose shot fired by one Tom Walch. Gangarene set in and Shaughnessy died."

No information is available in Minnesota Medical Records on Dr. Fair. The old settler tells me he was tall and skinny, wore a moustache and chin whiskers, and married a widow in later years.

Dr. C. B. Spencer first appears in the news items of the *Litchfield Ledger*, June 19, 1879:

"Dr. Spencer has finally been compelled to rent an office and go into practice. When he first came to this place, he gave it out that he did not intend to practice and would not. But one after another, cases have accumulated upon his hands, until he is kept busy most of the time. He has his office over Brill's drug store."

The old settler states that Dr. Spencer was in Manannah before Dr. Fair.

News Ledger, December 22, 1880—" 'A patient was made happy by skillful treatment by a Dr. Spencer.' Signed by Charles E. Garrison, Post Master, Roseville, Kandiyohi County. 'Treatment and medicine cost $35.00, cured his palsy.' "

News Ledger, August 11, 1881—"It is with pleasure that we announce the recovery of Mrs. M. Buckley under the skillful treatment of Dr. Spencer of Litchfield."

News Ledger, January 4, 1883—(Courtesy Card). "Physicians: Spencer, C. G. Office on 3rd Street, west of McLane's Store."

News Ledger, February 29, 1884—(Manannah News). "Dr. Spencer and Fair are healing the sick as usual."

Independent Review, May 20, 1884—(Manannah News). "Mrs. Rosie Phillips was stricken with acute rheumatism of the heart and stomach. Dr. Spencer was called, and at 6 p.m. she was up and about and ready for her rations."

Independent, January 13, 1885—"Dr. Spencer of Manannah is building a furnace in Rodalph's blacksmith shop to melt ore."

News Ledger, January 8, 1885—"Doc Spencer showed us some specimens of gold from the Manannah mining district; there is no doubt but that it is the pure root of all evil, and the only question is whether it can be found in paying quantities. Doc says he intends to thoroughly test the matter as soon as possible."

Independent, February 3, 1885—"If Spencer's gold mine is a success . . ."

Independent, October 26, 1885—"Dr. Spencer's chimney caught fire and burned his house down. He will rebuild."

Independent, January 4, 1886—(Grove City News). "Doc Spencer suddenly pulled stakes last Wednesday and emigrated only with the promise to return here again in May."

No more news items regarding Dr. Spencer could be found, nor a Minnesota Registration.

Dr. A. H. Carvill.—In the history and biography of Meeker county we find it stated that Dr. A. H. Carvill and his brother Jefferson had taken up a millsite in 1866, put up a sawmill and gristmill which constituted the entire business of this place. In 1873 the doctor sold out to John Norgren, and the firm was then operated under the name of Carvill and Norgren, Jefferson Carvill sole proprietor, but the firm then became silent due to litigation.

At that time Jefferson Carvill receives credit for laying out the town of (East) Kingston.

Dr. A. H. Carvill testified with logic in the trial of G. W. Donohue (sic) (Donovan), accused of the murder of James Flynn. According to Dr. Rosenthal, Dr. Carvill died at age ninety on November 3, 1933, of cerebral arteriosclerosis.

As to his exact status as a true physician, we cannot be sure, for we find nothing more of a medical nature than the fact that he testified in the trial of James Flynn, who was killed by gunshot wound, and his testimony was not of a definite scientific nature.

Dr. Westcott.—

News Ledger, February 24, 1881—(Dassel News). "Mrs. Simon Pratt who has been suffering so long with rheumatism is now improving under the skillful care of our esteemed citizen, Dr. Westcott. Electric treatment is now employed."

[Quack?—AUTHOR]

Dr. James Campbell.—

News Ledger, September 8, 1881—"Dr. James Campbell, M.D., of Hartford, Connecticut, will visit Litchfield September 18 and remain ten days. He has made a specialty of women's diseases and has been successful in the treatment of such. Any desiring to consult him or receive treatment will find him fully prepared to give the same. For further particulars, inquire of F. V. DeCoster.

[Dr. Campbell was a brother of Mrs. DeCoster.—AUTHOR]

Dr. L. Hall.—In October 27, 1881, we find the *Litchfield News Ledger* carrying the following two items, viz:

"Notice: Dr. L. Hall, Homeopathist and Electric Physician, has permanently located in Litchfield and is prepared to treat any and all cases that may be submitted to him. Office at present at E. B. Scofield's Residence. L. Hall, M.D."

In another place in the same edition we find:

"Rev. L. Hall resigned the position of pastor of the M. E. Church some time since, and last evening a meeting of the church people was held, at which the presiding elder was present. It was requested of the meeting that Rev. Hall fill the pulpit of the M. E. Church until a man could be found to take the same. This Mr. Hall has consented to do. He will continue his practice of medicine just the same, reports to the contrary notwithstanding."

We find in the *News Ledger* of December 15, 1881:

"Notice: Dr. L. Hall, Homeopathist and Electric Physician, has permanently located in Litchfield," et cetera.

There are no further news items or reports except

News Ledger, December 22, 1881—"Dr. Hall leaves this week for Chicago to attend the winter course of lectures at Hahnemann Medical College. Before his departure his many friends in Litchfield presented him with an elegant silver water pitcher costing between $20.00 and $30.00 as a token of their esteem and friendship. Accompanying the same with the hope that he make his permanent home in this place."

News Ledger (same date), December 22, 1881—"Dr. Hall who had arranged to leave for Chicago today is unexpectedly detained and will stay until Monday next."

No further news of Dr. Hall (Ed.), but the impression is that he was continuing an unfinished course in homeopathy at Hahnemann.

Dr. Kee Wakefield of Hutchinson, Minnesota, was a very active and conscientious practitioner of McLeod county during the 1880's. He was a charter member of the Crow River Medical Society and a member of the local Pension Committee. On August 20, 1889, he was delegated to examine local candidates for West Point. Further details of his career should be furnished by McLeod county.

[His progeny were rather striking people to my personal knowledge and acquaintance.—AUTHOR]

Dr. Granville Ira Smart, regular, practiced in Grove City during the year 1881, not, evidently, for a very long time. Dr. Roscoe C. Hunt has written up his biography in "Pioneer Physicians of Faribault County." He spent most of his years of practice in Blue Earth City, Minnesota.

Dr. Smart was born in Fryborg, Maine, November 14, 1853. He graduated from Fryborg Academy and attended Bardon's College, Brunsvick (Brunswick—Ed.), Maine. He taught school between semesters; graduated from Dartmouth Medical School in 1880; remained in Blue Earth City until 1901. Because his health was poor, he removed to Ontario, California, where he practiced until his death in

1906. He was a Mason and a member of the Methodist church. He had six children, three living in 1942, one (Elliot) a physician at Murphys, California.

Minnesota Directory, 1890: Blue Earth, and there registered until he died.

News Ledger, Litchfield, Minnesota, December 9, 1881—"G. I. Smart of Grove City has frequent medical calls in this vicinity."

Dr. Theron H. Bly.—On Dr. Bly, regular, the *Litchfield News Ledger* carries this September 4, 1882:

Courtesy Card
"Dr. Theron H. Bly, Physician and Surgeon
Grove City, Minnesota
Night calls promptly responded to."

News Ledger, June 15, 1882—"Among the professional cards will be found that of Dr. T. H. Bly who has lately located at Grove City."

His last professional card in the *Litchfield News Ledger* appears October 18, 1883, and his address is Grove City then.

Independent, December 16, 1884—(Manannah News). "Dr. Bly has his store building at Paynesville about ready for drugs."

News Ledger, 1885—"Dr. Bly practicing from Paynesville on Manannah patients."

News Ledger, June 31, 1888—"The people of Paynesville are trying hard to get some good man to go there and take the drug store lately left an orphan by Dr. T. H. Bly, who years ago was located at Grove City for a short time. This small speciman of a man, who by some hook or crook was permitted to attach the handle Dr. to his name, left Paynesville between two days because he could not withstand the temptation to sell poor whiskey without a license, and the iron clutches of the law were trying to fasten themselves upon him. He deserted a wife and one child, and we are informed that since his departure, the wife has disappeared, leaving the child to the cold charities of strangers, leaving the word that the doctor would come back and take care of his own young one. The doctor's present whereabouts is a mystery, but if he ever dies and anybody asks us to tell where he is likely to find him, we will direct them to the bottommost pit of Sheol."

Independent, June 29, 1886—(Manannah News). "Dr. Bly and Ostrander were taken to St. Cloud by sheriff Mickley last week charged with selling liquor without a license."

Editor Frank V. Cargill of the Directory of the A.M.A. offers this:

Records of the Directory Department were established in 1903, and of that time we attempted to obtain information on all physicians who were in practice since 1865.

We note that Theron H. Bly was listed in 1902 edition of Polks' Medical Directory at Minneapolis. This book states that he graduated from the University of Boston, Massachusetts, in 1876, the University Medical College, Kansas City, Missouri, in 1893, and took special courses in diseases of women at the University Medical College, Kansas City, Missouri, in 1894.

He is listed as Medical Examiner at Westfield, Massachusetts, and also as Medical Examiner of A.O.U.W. and for the Independent Order of Odd Fellows. His specialty was the diseases of women, and was listed as the physician in charge of Dr. Bly's Sanitarium which apparently was located at 3009 Harriet Avenue, Minneapolis. His name does not appear in the first edition of the American Medical Directory which was issued in 1906, and apparently he died sometime between 1902 and 1906.

Dr. William Chapman, regular, was born in Hill, New Hampshire, February 9, 1857, and was educated in the schools of New Hampton, New Hampshire, and

the University of Vermont at Burlington, Vermont; he graduated from the Medical Department of that institution in 1879.

He located in North Branch, Minnesota, and practiced there until 1882 when he came to Forest City and remained there until 1885. In December 28, 1882, he was married to Miss Georgia Kimball at Forest City by Rev. Charles W. Booth at the home of the bride's father, Edwin Kimball. "They will be at home to her friends until January 2, 1883, at the residence of her parents. No cards."

Further: "Dr. Chapman is a young man of sterling worth and well thought of in this section of the country, and his happy bride, Miss Georgia Kimball, is one of Meeker county's banner young ladies, having grown up at her home in Forest City. *The Ledger* hereby extends congratulations and well wishes, hoping that life may ever look as joyful to them as it did on their wedding day.—Doc Shake."

"In 1885, Dr. Chapman moved to Litchfield where he has since been active and successful in the practice of his profession. By training and practice Dr. Chapman is ably qualified to administer to the needs of ailing humanity, and he has been successful in a measure quite beyond that often reached in a community this size. He is a member of the Minnesota State Medical Society and Crow River Medical Society and is affiliated with the Odd Fellows, Workmen and Woodmen Societies."

Dr. Chapman was the son of John W. Chapman and Charlotte Toplin Chapman. No children were born to Dr. Chapman. Dr. Chapman was listed in the Minnesota Medical Directories in 1886 and 1890 as residing in Litchfield with License No. 778 dated January 26, 1884. His professional card appeared in the *News Ledger* in July, 1884, as physician and surgeon. The *News Ledger* went enough farther to announce in another column:

"He is a first-class gentlemen and understands his business; we wish him unboundless success."

In 1884: "Dr. Chapman has moved his family to Litchfield."

December 14, 1884: "Dr. Chapman moved his office over McLane's (grocery) Store."

We note that both the Republican and Democratic papers carried the news of his arrival to Litchfield.

Many further news notes appeared certifying to his presence in our midst as a doctor, but no drastic illustrations of medical treatment and surgery were ever found. Dr. Chapman joined with Dr. G. A. C. Cutts shortly after the turn of the century, and they practiced together in harmony until the death of Dr. Chapman by heart disease February 16, 1921.

Needless to say, many news items were published in the local papers in regard to Dr. Chapman's care of the sick. Further, I have the word of mouth from many of his patients who eventually came to my care that he was one of the finest. May I include the accolades of the nurses who knew him.

Dr. Chapman was rather small, wore a black moustache, seemed always rather polished and fine, was kindly, "straight-laced" and aristocratic.

The author and compilor had the privilege of being associated as medical assistant to Dr. Cutts, who in turn was Dr. Chapman's partner after 1900. My personal opinion was that these men were fine.

(To be continued in April issue)

STAPHYLOCOCCAL INFECTIONS

Excerpts from Reports Read at the Antibiotics Symposium

Spontin In Treating Severe Respiratory Infections –"In 13 of 20 patients the results were excellent, with clinical response being evident within one to four days after institution of therapy. In three additional patients, there was some degree of improvement in pneumonic processes superimposed on tuberculosis in two cases and on pulmonary neoplasm in one. In all other cases, serious antecedent pathology undoubtedly influenced the negative or equivocal response to ristocetin therapy.[6]"

Spontin In Treating Staphylococcal Infections–After successfully treating 28 patients, the authors wrote, "Ristocetin or Spontin has proved to be bactericidal and bacteriostatic, particularly for the *Staphylococcus aureus,* which is often resistant to many other antibiotics.[5]"

Spontin In Treating Seven Difficult Cases – "Ristocetin has produced excellent results in eradicating, mitigating or preventing infection in seven selected difficult cases. Six of the seven cases involved *Staphylococcus aureus* which did not respond to chemotherapy with other antibiotics.[7]"

Spontin Blood Levels In Children – "Ristocetin was administered as a single intravenous injection of 12.5 milligrams per kilogram. This resulted in serum levels ranging from 1.3 to 10.6 mcg. after two hours with a gradual fall to a level of 0.7 mcg. per cubic centimeter or less after 12 hours.[8]"

Spontin In Treating Staphylococcal Pneumonia –"Ristocetin was used in the treatment of 24 patients with staphylococcal pneumonia, 17 of whom had failed to respond to previously administered antibiotics. Complete clearing of pneumonitis was obtained in 16 patients and significant improvement occurred in two others. Two patients died of pneumonia; four others succumbed to other lethal diseases.[9]"

Spontin In Treating Children and Adults – "Ristocetin completely controlled severe staphylococcal infections in 11 adults and six children who received adequate therapy.[10]"

1. Totals represent published reports and personal communications to Abbott Laboratories.
2. Sixth Annual Symposium on Antibiotics, Washington, D. C., Oct. 15, 16, 17, 1958.
3. Romansky, M. J., and Holmes, R., Successful Short-Term Therapy of Enterococcal and Staphylococcal Endocarditis with Ristocetin–Seven Patients. Preliminary Report, Antibiotics Annual, 1957-58, p. 187.
4. J. A. M. A., 167:1584, July 26, 1958.
5. Bush, L. F., et al., The Use of Ristocetin (Spontin) in Staphylococcal Infections, In Press, Antibiotics Annual, 1958-59.
6. Billow, F. J., et al., Clinical Observations on Ristocetin–A Preliminary Report on its Efficacy and Toxicity in 20 Unselected Severe Respiratory Infections, In Press, Antibiotics Annual, 1958-59.
7. Miller, J. M., et al., Ristocetin in the Treatment of Seven Selected Difficult Cases, In Press, Antibiotics Annual, 1958-59.
8. Asay, L. D., et al., Ristocetin Serum Levels in Children, In Press, Antibiotics Annual, 1958-59.
9. Schumacher, L. R., et al., Experiences with Ristocetin in Staphylococcal Pneumonia: Observations in 23 Cases, In Press, Antibiotics Annual, 1958-59.
10. Terry, R. B., Ristocetin in Children and Adults, In Press, Antibiotics Annual, 1958-59.

Meetings and Announcements

NATIONAL

American Academy of General Practice, credit course. Sponsored by Northeast Florida Heart Association. Annual seminar on Cardiovascular Diseases, Prudential Auditorium, Jacksonville, Florida, February 19-21, 1959.

American College of Allergists Graduate Instructional Course and Annual Congress, March 15-20, 1959, Mark Hopkins Hotel, San Francisco, California. Contact: John D. Gillaspie, M.D., Treasurer, 2049 Broadway, Boulder, Colorado.

American College of Surgeons sectional meetings:

February

Sectional Meeting, Shamrock Hilton Hotel, Houston, Texas, February 2-4. Dr. J. Griffin Heard, Houston, Local Chairman; Dr. Michael L. Mason, Secretary, 40 East Erie Street, Chicago 11, Illinois.
Sectional Meeting, Hotel Vancouver, Vancouver, B. C., February 26-28. Dr. T. R. Sargeant, Local Chairman; Dr. Michael L. Mason, Secretary, 40 East Erie Street, Chicago 11, Illinois.

March

Four-day Sectional Meeting for Surgeons and Nurses, Kiel Auditorium, St. Louis, Missouri, March 9-12. Dr. Frank McDowell, St. Louis, Local Chairman for Surgeons Meeting; Miss Joyce Brueggeman, R.N., Local Chairman for Nurses Meeting; Dr. Michael L. Mason, Secretary, 40 East Erie Street, Chicago 11, Illinois.

April

Four-day Sectional Meeting for Surgeons and Nurses, The Queen Elizabeth Hotel, Montreal, Quebec, April 6-9. Drs. Harry S. Morton and Charles Edouard Hebert, Montreal, Local Chairmen for Surgeons Meeting; Miss Moyra Allen and Sister Denise Lefevre, Montreal, Local Chairmen for Nurses Meeting; Dr. Michael L. Mason, Secretary, 40 East Erie Street, Chicago 11, Illinois.

September

Annual Clinical Congress, Atlantic City, New Jersey, September 28-October 2. Dr. Michael L. Mason, Secretary, 40 East Erie Street, Chicago 11, Illinois.

Chicago Postgraduate Course in Arthritis and Related Conditions, February 19, 20 and 21, 1959, Thorne Hall, Northwestern University, Lake Shore Drive at Superior Street, Chicago, Illinois. Tuition $50. Frank R. Schmid, M.D., 303 East Chicago Avenue, Chicago 11, Illinois, Secretary.

Mediclinics, fourth annual refresher course of postgraduate medical education, Fort Lauderdale, Florida, March 2-12, 1959. (Acceptable for 32 hours of postgraduate study—Category I credit for American Academy of General Practice members).

INTERNATIONAL

Association of the National European and Mediterranean Societies of Gastroenterology sixth meeting, Leiden, The Netherlands, April 20 to 24, 1960.

MAYO CLINIC REVIEWS DATES SET

Staff members of the Mayo Clinic and the Mayo Foundation for Medical Education and Research will present again this year a three-day program of lectures and discussions on problems of current interest in general medicine and surgery, April 13, 14, 15, 1959.

Up to twenty-one hours of Category I credit may be obtained by American Academy of General Practice members who attend.

There are no fees for this program.

The number of physicians who can be accommodated is necessarily limited. Those wishing to attend should communicate with the Clinical Reviews Committee, Mayo Clinic, Rochester, Minnesota.

SUBMISSION OF BILLS FOR SERVICES RENDERED TO ARMY MILITARY PERSONNEL BY CIVILIAN HOSPITALS AND PHYSICIANS

As a general rule, civilian medical agencies are aware of the appropriate channels for submission of their charges for care furnished Army military personnel. They are informed of the correct procedure, either by prior arrangement with the appropriate military authority for routine medical care of personnel under their jurisdiction, or through notification to the patient's Commanding Officer, or the Surgeon of the Army area in which emergency type of service is rendered.

In situations where the above does not apply or when the civilian medical agency is in doubt concerning the normal procedure, bills may be submitted directly to Headquarters Fifth US Army, Office of Army Surgeon, 1660 East Hyde Park Boulevard, Chicago 15, Illinois, with a request that they be placed in appropriate channels for settlement.

Such bills should show name, rank, service number, organization and duty station of the patient, disease or disability treated, inclusive dates and nature of the services, and a brief statement of the incident leading to the treatment.

The above pertains *only* to care of military personnel, and should *not* be confused with the established procedures for the processing of claims for care of eligible military dependents under Medicare.

MAYO CLINIC ANNUAL STAFF MEETING

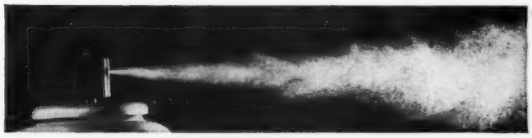
Dr. O. T. Clagett, head of a section of surgery, was elected president of the staff at the annual meeting of the staff of the Mayo Clinic to succeed retiring president, Dr. G. J. Thompson. Other officers elected were Drs. H. W. Schmidt, vice president; C. A. Owen, Jr., secretary; and W. G. Sauer and G. W. Daugherty, councilors. Re-election of Dr. J. T. Priestley, present chairman of the Board of Governors of the Mayo Clinic and head of a section of surgery, and Dr. C. F. Code, chairman

(Continued on Page A-50)



in a form to fit

every  antibiotic 



need ...

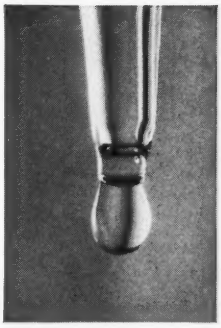


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ACHROMYCIN: Capsules • Ear Solution 0.5% • Intramuscular • Intravenous • Nasal Suspension with Hydrocortisone and Phenylpherine Ointment 3% • Ointment 3% with Hydrocortisone 2% • Ophthalmic Oil Suspension 1% • Ophthalmic Ointment 1% • Ophthalmic Ointment 1% with Hydrocortisone 1.5% • Ophthalmic Powder (Sterilized) • Oral Suspension • Pediatric Drops • PHARYNGETS® TROCHES Soluble Tablets • SPERSOIDS® Dispersible Powder • Surgical Powder (Sterilized) • Syrup • Tablets • Topical Spray • Troches

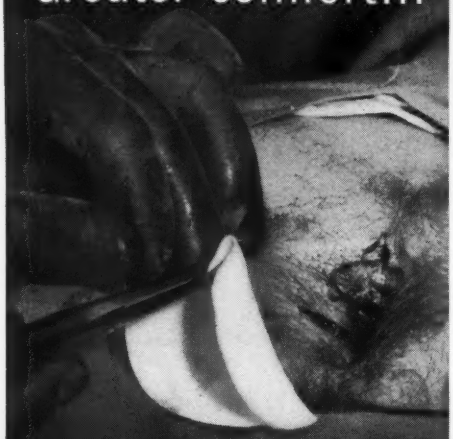
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MAYO CLINIC ANNUAL STAFF MEETING

(Continued from Page A-48)

of the section of physiology, to the board was confirmed. Retiring members of the staff who were honored at the meeting were Dr. H. E. Essex, co-chairman of the section of physiology; Dr. R. K. Ghormley, senior consultant in and former head of the section of orthopedic surgery; Dr. H. C. Habein, senior consultant in and former head of a section in medicine; Dr. Julia F. Herrick, senior consultant in biophysics; Dr. C. F. Schlotthauer, senior consultant in and former head of the section of veterinary medicine; and Dr. J. F. Weir, senior consultant in and former head of a section in medicine.

Those who joined the staff fifty or more years ago and who were recognized at the meeting were Dr. H. Z. Giffin, fifty-two years ago; Dr. W. F. Braasch, Dr. D. C. Balfour and Dr. W. C. MacCarty, fifty-one years ago; and Dr. G. B. Eusterman and Mr. H. J. Harwick, fifty years ago.

Addresses were given by Dr. Thompson, Dr. Priestley, and Dr. Victor Johnson, director of the Mayo Foundation.

New members of the staff presented were: Drs. L. A. Aaro, consultant in section of obstetrics and gynecology; A. J. Bianco, Jr., consultant in section of orthopedic surgery; E. O. Burgert, Jr., consultant in section of pediatrics; G. D. Davis, consultant in section of diagnostic roentgenology; M. B. Divertie, consultant in section of medicine; D. E. Donald, consultant in section of surgical research; H. N. Huffman, II, consultant in section of medicine; H. K. Ivy, consultant in section of medicine; R. E. Lee, consultant in section of therapeutic radiology; E. M. Litin, consultant in section of psychiatry; D. C. McGoon, consultant in section of surgery; E. A. Moffitt, consultant in section of anesthesiology; J. T. Shepherd, consultant in section of physiology; R. L. Sommerville, consultant in section of medicine; E. H. Soule, consultant in section of surgical pathology; G. B. Stickler, consultant in section of pediatrics; D. C. Utz, consultant in section of urology; R. E. Weeks, consultant in section of medicine; W. H. Weidman, consultant in section of pediatrics.

BLUE EARTH VALLEY MEDICAL SOCIETY

A Fairmont physician, Dr. Harold A. Williamson, was elected president of the Blue Earth Valley Medical Society at the annual meeting in Blue Earth. He replaces Dr. Richard Virnig, Wells. Other officers elected include, Dr. O. B. Bergman, St. James, vice president; Dr. H. Boysen, Madelia, secretary-treasurer; Dr. Mark Vernig, Wells, delegate to the annual meeting of the Minnesota State Medical Association, and Dr. E. E. Zemke, Fairmont, alternate delegate.

RED RIVER VALLEY MEDICAL SOCIETY

The fall meeting of the Red River Valley Medical Society was held at the Rex Cafe in Thief River Falls. Dr. Joseph Kiser, department of surgery, Minneapolis General Hospital, discussed "Positive Staphylococcus Aureus Infections," and demonstrated a new type of

(Continued on Page A-52)

new for cough



tastes good

the straws just symbolize the good flavor! And DIMETANE EXPECTORANT for cough is as effective as it is delicious. FORMULA: each 5 cc. (1 teaspoonful) contains: DIMETANE (Parabromdylamine Maleate) 2.0 mg.; Glyceryl Guaiacolate 100.0 mg.; Phenylephrine Hydrochloride, USP 5.0 mg.; Phenylpropanolamine Hydrochloride, NNR 5.0 mg.; Alcohol 3.5% in a good-tasting aromatic base.

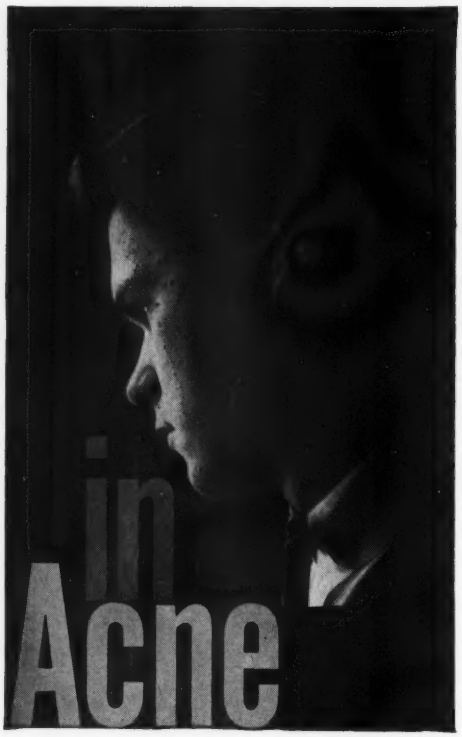
works better

combines the unsurpassed antihistamine Dimetane with the clinically proven expectorant glyceryl guaiacolate (which increases R.T.F. almost 200%) and two recognized decongestants. When additional cough suppressant action is indicated, prescribe DIMETANE EXPECTORANT-DC, which provides the basic formula with dihydrocodeinone bitartrate 1.8 mg. per 5 cc. (exempt narcotic).

Dimetane® Expectorant
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Robins

(WITH DIHYDROCODEINONE BITARTRATE 1.8 MG./5CC.)



"No patient failed to improve."[1]

pHisoHex washing added to standard treatment in acne produced results that "... far excelled ... results with the many measures usually advocated."[1]

pHisoHex maintains normal skin pH, cleans and degerms better than soap. In acne, it removes oil and virtually all skin bacteria *without scrubbing.*

For best results—four to six washings a day with pHisoHex will keep the acne area "surgically" clean.

1. Hodges, F. T.: *GP* 14:86, Nov., 1956.

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Sudsing nonalkaline antibacterial detergent—nonirritating, hypoallergenic. Contains 3% hexachlorophene.

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RED RIVER VALLEY MEDICAL SOCIETY

(Continued from Page A-50)

surgical mask to reduce these infections in hospitals. Dr. Claude R. Hitchcock, chief, department of surgery of Minneapolis General Hospital, discussed the "Present Status of Surgery for Arterial Disease."

Dr. and Mrs. C. L. Oppegaard, Dr. and Mrs. John Cameron, Dr. and Mrs. Donald Stewart and Dr. R. O. Sather of Crookston attended.

MINNESOTA OBSTETRICAL AND GYNECOLOGICAL SOCIETY

New officers of the Minnesota Obstetrical and Gynecological Society announced recently are Dr. Eugene M. Kasper, St. Paul, president; Dr. Edward A. Banner, Rochester, vice president, and Dr. Alex Barno, St. Louis Park, secretary-treasurer. Dr. Jane E. Hodgson, St. Paul, was elected to a one-year term on the society's Board of Directors to replace the late Dr. Louis L. Friedman of St. Paul. Dr. Harold R. Leland, Minneapolis, was elected to a three-year term.

COURSE IN INDUSTRIAL EYE PROBLEMS

A four-day course in eye care and industrial eye programs will be presented by the Institute of Industrial Health and the Department of Ophthalmology of the University of Cincinnati on March 9-12, 1959. The course will be open to physicians only with preference given to men in active industrial practice. The objective of the course is to furnish the Industrial Physician with up-to-date information regarding eye care in industry.

For additional information and application, write Secretary, Institute of Industrial Health, Kettering Laboratory, Eden and Bethesda Avenue, Cincinnati 19, Ohio.

CONTINUATION COURSES

Medical continuation courses to be presented at the Center for Continuation Study, University of Minnesota, include the following:

January 22-24—Surgery for Surgeons
February 23-25—Cardiovascular Diseases for General Physicians
March 2-4—Pediatrics for General Physicians
March 14—Trauma for General Physicians
March 16-18—Internal Medicine for Internists
March 30-April 3—Basic Concepts of Water and Electrolyte Balance for General Physicians

For further information concerning the above courses, write to the Director, Department of Continuation Medical Education, 1342 Mayo Memorial, University of Minnesota, Minneapolis 14.

"FIGHT ALCOHOLISM DAY" OBSERVED

Governor Orville Freeman proclaimed Sunday, January 18, 1959, as "Fight Alcoholism Day." This was the first time in the history of the state that such a

(Continued on Page A-54)

in corticosteroid therapy of allergic diseases asthma-hay fever allergic rhinitis allergic dermatitis drug reactions



Decadron*

DEXAMETHASONE

to treat more patients more effectively

a new order of magnitude in therapeutic effectiveness
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Excellent and good-to-excellent results are reported† with DECADRON in nearly all of 362 patients with various allergic disorders, including a number of cases who had failed to respond to other corticosteroids. **No major reactions** were observed in these extensive clinical studies even after four months of continuous therapy—DECADRON produced no peptic ulcer, no diabetes, no significant hypertension, no sodium retention, no potassium depletion, no edema, no undesirable psychic reactions, and no unusual or new side effects. Less than five per cent of patients experienced minor reactions, none of which prevented continuing administration of DECADRON.

Moreover, several investigators report that side effects induced by previous corticosteroid therapy such as gastric intolerance, peripheral edema, headache, vertigo, muscle weakness, ecchymoses, flushing, sweating, moon facies, hypertension, hirsutism, and acne **often disappeared during therapy with DECADRON.** †Analysis of clinical reports.

Dosage: One 0.75 mg. tablet of DECADRON will replace one 4 mg. tablet of methylprednisolone or triamcinolone, one 5 mg. tablet of prednisone or prednisolone, one 20 mg. tablet of hydrocortisone, or one 25 mg. tablet of cortisone.

Detailed information on dosage and precautions is available to physicians on request.

Supplied: As 0.75 and 0.5 mg. scored, pentagon-shaped tablets in bottles of 100.

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"FIGHT ALCOHOLISM DAY" OBSERVED

(Continued from Page A-52)

proclamation had been made. The proclamation was put into the charge of the Citizens' Commission on Alcoholism, Inc., that they might spearhead the observance in the state.

Noting that alcoholism is "six times more prevalent than cancer and eleven times more prevalent than tuberculosis," the governor called on the people of Minnesota "to achieve a better knowledge of the causes of alcoholism and the means of combating it so that this social problem can be approached with greater understanding and concern for those afflicted."

Since alcoholism is a difficult problem cutting across many areas such as sociology, religion, local controls, medicine, psychiatry, education and economics, Governor Freeman pointed out that "good home life, pleasant living conditions, better educational opportunities that a fuller appreciation of spiritual values, will eliminate many of the malignancies causing alcoholism."

The Citizens' Commission, in sending out scores of thousands of copies of the proclamation to schools, churches and public institutions call for more sympathetic understanding of the victims of alcoholism, more adequate alcohol education in public schools, more hospital beds available for the ailing alcoholic, more out-patient clinics, and greater efforts in rehabilitation of the alcoholic.

The Commission, being persuaded that the alcoholic is an ailing individual that needs to be helped, has set up counseling centers in many cities, and a rehabilitation clinic in Minneapolis. They publish matters pertaining to alcohol information, conduct research projects, and sponsor seminars for high school young people as well as mass meetings on the adult level. The Citizens' Commission, being a non-profit organization rather than a government agency, is supported wholly by corporate contributions, private and membership donations.

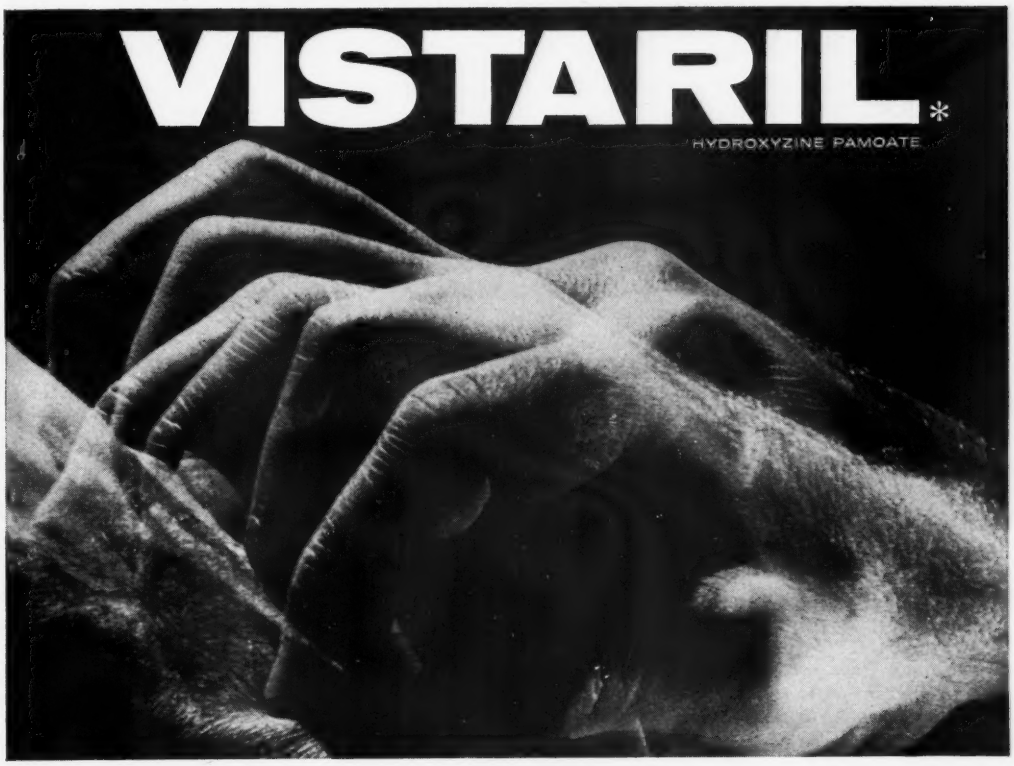
"NAME" ORGANIZED

A group of more than 150 physicians in the Minneapolis-St. Paul area have organized the Northern Association for Medical Education (NAME). The purpose of this organization is to foster the development of a four-year private medical school in St. Paul.

Officers of the organization are: Davitt A. Felder, M.D., President; Edward P. Burch, M.D., Vice President; Ian A. Brown, M.D., Secretary and Ben Sommers, M.D., Treasurer.

Membership in this organization is open to all physicians. Any physician interested in this project and wishing to join the organization, is requested to write to: NAME, 527 Lowry Medical Arts Building, St. Paul 2, Minnesota.

IN URTICARIA AND PRURITUS



A PSYCHOTHERAPEUTIC ANTIHISTAMINE

(as designated by A.M.A. Council on Drugs, 1958)

SPECIFIC ANTIHISTAMINIC ACTION in the treatment of a variety of skin disorders commonly seen in your practice.

"While some of the tranquilizers are only partially effective as far as antiallergic activities are concerned... [hydroxyzine] has been found, by comparison, to be the most potent thus far . . ."[1]

"The most striking results were seen in those patients with chronic urticaria of undetermined etiology."[2]

PLUS

PSYCHOTHERAPEUTIC POTENCY for the relief of anxiety and tension.

The psychotherapeutic effectiveness of hydroxyzine (VISTARIL) was confirmed in a series of 479 patients suffering from a wide variety of dermatoses, including atopic dermatitis, neurodermatitis, psoriasis, lichen planus, nummular eczema, dyshidrosis, pruritus ani and vulvae, and rosacea. "Adverse reactions were minimal."[3]

RECOMMENDED ORAL DOSAGE: *50 mg. q.i.d. initially; adjust according to individual response.*

VISTARIL Capsules: *25 mg., 50 mg., 100 mg.*

VISTARIL Parenteral Solution: *10 cc. vials and 2 cc. Steraject® Cartridges. Each cc. contains 25 mg. hydroxyzine (as the HCl).*

More than a tranquilizer

REFERENCES:
1. Eisenberg, B. C.: Clinical Medicine *5*:897-904 (July) 1958.
2. Feinberg, A. R., et al.: J. Allergy *29*:358 (July) 1958.
3. Robinson, H. M., et al.: So. Med. J. *50*:1282 (Oct.) 1957.

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Woman's Auxiliary

MID-WINTER BOARD MEETING

The board of the Woman's Auxiliary to the Minnesota State Medical Association will hold its mid-year meeting on Monday, February 2, at the Women's City Club, 305 St. Peter Street, St. Paul. The meeting will convene at 9:00 a.m. and will be followed by a luncheon and program. Mrs. Reuben Erickson, State Auxiliary President, urges everyone whose name appears on the state roster to attend.

"It is imperative that every area is represented, so please arrange to have another member of your auxiliary present if you are unable to attend," urges Mrs. Erickson.

STATE AUXILIARY AMA CLINICAL ACTIVITIES

The auxiliary activities of the AMA Clinical Meeting held in Minneapolis, December 2-5, were well attended. On each occasion—the tea at the American Swedish Art Institute Tuesday afternoon, the brunch at Southdale, and the luncheon and tour of General Mills on Thursday —the women felt they were "royally entertained."

Mrs. E. Arthur Underwood, AMA Auxiliary president; Margaret Wolfe, national executive secretary, and Mrs. Charles L. Goodhand, national legislative chairman, were among the eminent guests. Minnesota Auxiliary members attending considered it a great pleasure to meet and become acquainted with these women. A dinner in Mrs. Underwood's honor was given by some of the officers of the local auxiliaries on Monday evening at the Minneapolis Club. More detailed information on the convention will appear in the next issue of *The Gopher Doctor's Wife.*

RANGE AUXILIARY PLANS NEW CODE

Mrs. R. A. Murray has been named chairman of a committee formed by the Range Medical Society Auxiliary to form a new constitution. The society was recently separated from the St. Louis County Medical Society Auxiliary.

Mrs. L. W. Johnsrud, Hibbing, president of the Range Society, appointed the committee. Those serving besides Mrs. Murray are Mrs. Oscar Wilbur and Mrs. L. G. Thouin, Hibbing; Mrs. R. T. Kelly and A. V. Grinley, Grand Rapids; Mmes. R. E. Barnes, Aurora, and C. E. Goodman, Virginia.

RAMSEY COUNTY PAST PRESIDENTS FETED

Past presidents of the Woman's Auxiliary to the Ramsey County Medical Society were guests of honor at a November luncheon meeting. Mrs. John Stuhr, president of the Washington County Auxiliary, was the guest of Mrs. Herman J. Wolff, Ramsey County member and state regional adviser for the Fifth District. Other members of the Washington County Auxiliary were also invited to attend.

The program featured a demonstration of holiday floral decorations. Mrs. Ellery M. James and Mrs. Brian J. McGroarty, chairmen, reported on the auxiliary project to provide transportation for student nurses speaking in local high schools on nursing as a career.

ZUMBRO VALLEY AUXILIARY HEADS ANNOUNCED

New officers and committee chairmen were announced and a talk was given by Miss Madelyne Sturdavant at the November luncheon meeting of the Zumbro Valley Medical Auxiliary at the Rochester Country Club.

Miss Sturdavant talked on the special observation unit at the Rochester Methodist Hospital.

New officers are Mrs. D. C. Dahlin, president; Mrs. O. H. Beahrs, vice president; Mrs. David Hanlon, treasurer; and Mrs. James K. Masson, secretary.

Committee chairmen are Mrs. William Wellman, American Medical Education Foundation; Mrs. G. R. Diessner, cancer; Mrs. J. W. DuShane, legislation; Mrs. James R. Doyle, *Today's Health* magazine; Mrs. G. M. Martin and Mrs. Donald Erickson, membership; and Mrs. H. F. Polley, regional adviser.

HENNEPIN COUNTY AUXILIARY CHRISTMAS LUNCHEON

The Christmas luncheon of the Woman's Auxiliary to the Hennepin County Medical Society was held Friday, December 5, at the Interlachen Country Club. Mrs. Frances Miller presented a lovely program of harp music, with a very enlightening and entertaining description of the instrument and its mechanics.

PRESCRIPTIONS

Recent survey disclosed that 90 per cent of the 750 million prescriptions written annually are for medications and products not available even ten years ago according to Dr. Raymond C. V. Robinson, University of Maryland.—*AMA News*



Now—All cold symptoms can be controlled



Provides Triaminic for more complete and more effective relief from nasal and paranasal congestion because of systemic transport to *all* respiratory membranes—without drawbacks of topical therapy.†

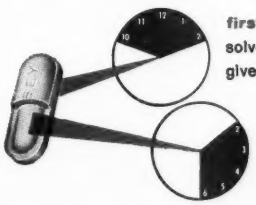
Provides well-tolerated APAP (N-acetyl-p-aminophenol) for prompt and effective analgesic and antipyretic action to make the patient more comfortable.

Provides Dormethan (brand of dextromethorphan HBr) for non-narcotic antitussive action on the cough reflex center in the medulla—as effective as codeine but without codeine's drawbacks.

Provides terpin hydrate, classic expectorant to thin inspissated mucus and help the patient clear the respiratory passages.

†Lhotka, F. M.: Illinois M. J. 112:259 (Dec.) 1957. Fabricant, N. D.: E. E. N. T. Monthly 37:460 (July) 1958. Farmer, D. F.: Clin. Med. 5:1183 (Sept.) 1958.

Special "timed release" design



first—the outer layer dissolves within minutes to give 3 to 4 hours of relief

then—the inner core releases its ingredients to sustain relief for 3 to 4 more hours

also available for those patients who prefer liquid medication: Tussagesic suspension

Each TUSSAGESIC tablet provides:

TRIAMINIC®	50 mg.
(phenylpropanolamine HCl	25 mg.
pheniramine maleate	12.5 mg.
pyrilamine maleate	12.5 mg.)
Dormethan (brand of dextromethorphan HBr)	30 mg.
Terpin hydrate	180 mg.
APAP (N-acetyl-p-aminophenol)	325 mg.

Dosage: One tablet in the morning, midafternoon and in the evening, if needed.

Tussagesic® *timed-release tablets*

**Contains* TRIAMINIC *to* STOP *running noses*   *and open stuffed noses orally*

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In Memoriam

HOMER P. DREDGE

Dr. H. P. Dredge, prominent pioneer resident of Sandstone, died at the Asbury Hospital, Minneapolis, November 27, 1958. He had spent the past year with his children in Minneapolis. He was eighty-eight years of age at the time of his death.

Homer Percy Dredge was born in Blue Earth County, Minnesota, August 4, 1870. He graduated from the Mankato State Teachers Normal School in 1893 and from the Rush Medical College in 1896. He practiced medicine at Belview from 1896 to 1903 and the family came to Sandstone in 1903.

He took an active lead in all community activities. He was instrumental in helping to secure the former Federal Correctional Institution at Sandstone, which at the present is used as a State Mental Hospital. He was also instrumental in promoting a County Hospital to be located at Sandstone and his dream was realized with the erection of the twenty-five-bed Pine County Memorial Hospital.

In 1955, the Hartley M. Robey American Legion Post of Sandstone sponsored the Sandstone Hall of Fame, and Dr. Dredge was selected to be honored at a Hall of Fame dinner held July 16, 1955. Funds from the Hall of Fame project were used to furnish the waiting room as a memorial to Dr. Dredge, in the new Pine County Memorial Hospital.

Dr. Dredge served as Sandstone health officer for more than forty-five years. He was a member of the school board thirteen years, was Past Master of the Sandstone Masonic Lodge, member of the Eastern Star and Odd Fellow Lodges, past trustee of the Congregational Church, life member of the Sandstone Chamber of Commerce.

On January 22, 1948, Dr. and Mrs. Dredge celebrated their golden wedding anniversary. Mrs. Dredge passed away January 21, 1956.

In 1955, Dr. Dredge was granted a life membership in the Minnesota State Medical Association. He held memberships in the Pine County, East Central and Hennepin County Medical Societies.

Surviving are three daughters, Ethel Dredge, Florence (Mrs. Earl Lyons) of Minneapolis, and Alice (Mrs. Paul Wylie) of Bozeman, Montana; three sons, Dr. Thomas Dredge, Tomah, Wisconsin; Homer Dredge, Waverly, and Robert Dredge, Richfield. He is also survived by one brother, George, Minneapolis, and three sisters, Marion Thorne and Stella Lombard in Florida and Jessie Barnes, Vernon Center, Minnesota.

LEE McKENDREE EATON

Dr. Lee McKendree Eaton, chairman of the sections in the Mayo Clinic and professor of neurology of the Mayo Foundation, died November 18, 1958, at the Methodist-Worrall Hospital in Rochester after a short illness.

Dr. Eaton was born at Owaneco, Illinois, on February 3, 1905. He received his M.D. degree from Rush Medical College, Chicago, in 1932, and served an internship in the Cook County Hospital. He became a Fellow in neurology in the Mayo Foundation in 1933 and a consultant in neurology on the staff of the Mayo Clinic in 1936.

Dr. Eaton was a Fellow of the American Academy of Neurology, a member of the advisory board of the Myasthenia Gravis Association and the American Neurological Association. He was president of the Central Neuropsychiatric Association in 1953. In addition, he was a member of the Association for Research in Nervous and Mental Diseases of which he was president at the time of his death, the Alpha Omega Alpha honorary medical society, a director of the American Board of Neurology and Psychiatry (examiner) and a member of Nu Sigma Nu. Dr. Eaton was a member of the Zumbro Valley Medical Society, the Minnesota State Medical Association and the American Medical Association.

Nonvocational organizations of which Dr. Eaton was a member include the Society of Sigma Xi and the Universalist Church of America. His hobbies were photography, horticulture, boating, hunting and fishing, and Mississippi River lore.

Survivors include his wife, Mary Louise, and five children: Elizabeth B. (Mrs. Eugene D. Monson), of Minneapolis; Lynne S., Emily J., Charles M., and Thomas L., of Rochester, and one grandchild, William E. Monson.

FRANK R. HIRSHFIELD

Dr. Frank R. Hirshfield, St. Louis Park physician and surgeon, died December 16, 1958. He was sixty-four years of age at the time of his death.

Specializing in the industrial practice of medicine, Dr. Hirshfield also operated the Hirshfield paints and wallpaper stores in Minneapolis.

Dr. Hirshfield was born in Minneapolis and received his preliminary education in St. Thomas High School and the University of Minnesota. His medical education was obtained at the University of Minnesota Medical School.

He was a staff member at Eitel and Minneapolis General Hospitals, and was also a member of the Hennepin County Medical Society, the Minnesota State Medical Association, and the American Medical Association. He was a member of Minneapolis Masonic Lodge No. 19.

He is survived by his wife, Ruth; a son, Frank; a daughter, Mrs. Kenneth Heidelberg, and his mother, Mrs. Elizabeth Hirshfield, all of Minneapolis.

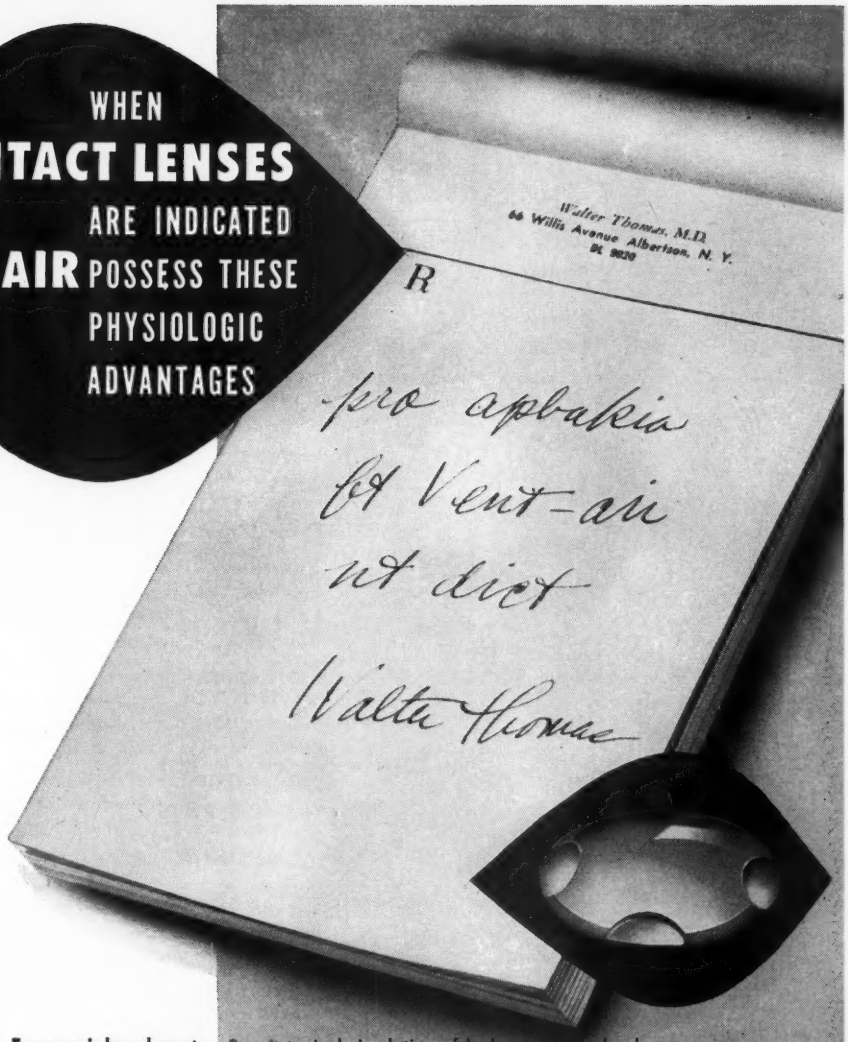
WALTER F. MUIR

Dr. Walter F. Muir, Browns Valley physician, died December 12, 1958. He was fifty years of age at the time of his death.

Dr. Muir graduated from the University of Minnesota Medical School in 1933 and practiced in Graceville, Minnesota, prior to service with Army Medical

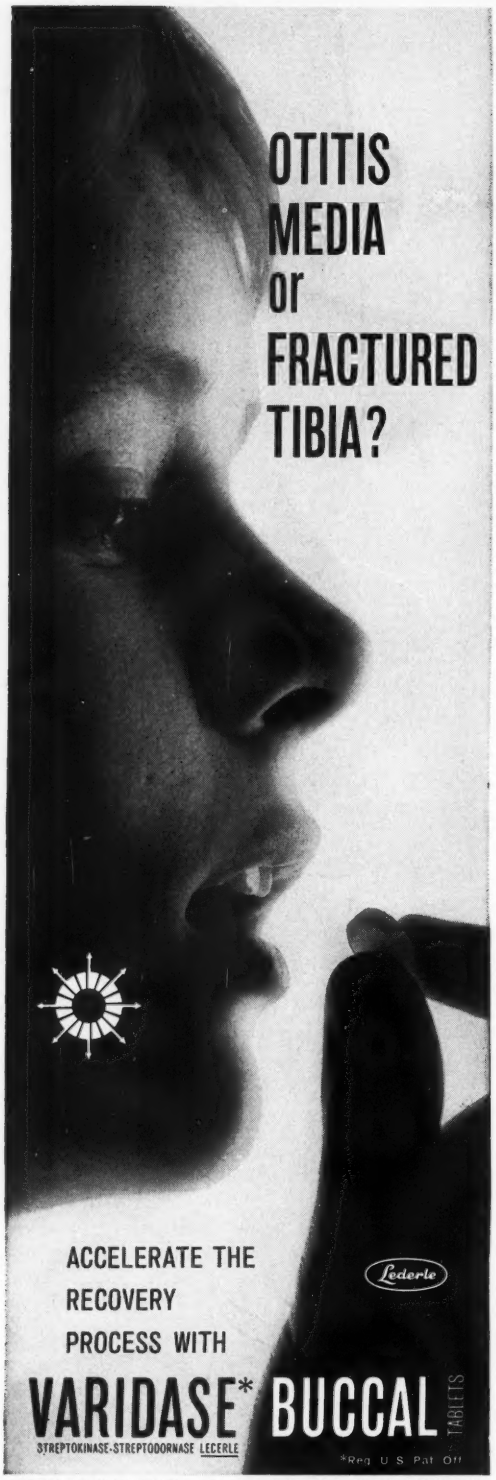
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VENT-AIR POSSESS THESE
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Ultra-Smoothness of Inner and Outer Surfaces	Avoid limbal epithelial and tarsal conjunctival exacerbation
Highly absorptive methyl-methacrylate composition	Simulates "wetting" and moisture-retention properties of cornea (of military specification)
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Custom-fitted	In uni-, bi-, or tri-curve radii conforming to corneal peripheral asphericities
Hyper-thinness of edge or center	Maintains uniform thickness in high myopia or hyperopia approximating .20 mm irrespective of power
Widest range of inner radii	From 5.0 to 10.00 mm providing for extremes of keratoconic and megaloglobic dimensions
Cosmetic, pin-hole and tinted effects	For leucomatous, polyopic, iridodialytic and albinic conditions or other corneal or media anomalies.

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WALTER F. MUIR

(Continued from Page A-58)

Corps in World War II. Since 1946, he had practiced in Browns Valley.

He was a member of the West Central Minnesota Medical Society, the Minnesota State Medical Association, the American Medical Association, Psi Upsilon fraternity, Nu Sigma Nu medical fraternity, and William Krersing American Legion post in Browns Valley.

Survivors include his wife, Candace; two sons, Edwin and Robert, both of Browns Valley; two sisters, Mrs. Joseph R. Watkins, Winona, Minn., and Mrs. Donald F. McConnon, Minneapolis; and a brother, Dr. Edwin C., Tacoma, Washington.

EDWIN J. SIMONS

Dr. Edwin J. Simons, Executive Director of Minnesota Blue Shield and one of the founders of that organization, died December 11, 1958. He was sixty-two years old.

A former president of the Minnesota State Medical Association, Dr. Simons had practiced at Swanville, Minnesota, for twenty-five years before becoming medical director of Blue Shield in 1950.

He graduated from the University of Minnesota Medical School and received a distinguished alumni award in 1956.

In addition, he was a member of the Hennepin County Medical Society, Minnesota State Medical Association, and the American Medical Association. He was also a member of the Masons, the American Legion, and was a fellow of the American College of Physicians.

Surviving are his wife, Hazel C.; a son, Jack Scott; a daughter, Galen Claire, all of Edina; three brothers, Dr. John B. and H. R. Simons, both of Whitefish, Mont., and Thomas W. Simons, Madras, India; three sisters, Mrs. Julia Westling, Minneapolis, Mrs. Irene Allen, Greenbush, Minnesota, and Mrs. Mary Johnston, Frankfurt, Germany.

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Minnesota Blue Cross—Blue Shield

The Minnesota Blue Shield Professional Relations Staff made 5,764 calls at doctors' offices throughout the state during the first eleven months of 1958, and over 1,350 calls resulted in personal visits with doctors.

The aim of the professional relations program, which is service to the medical profession and the public, is best served by personal calls to doctors' offices by professional relations representatives. Much can be accomplished, even though those calls do not result in personal visits with doctors, because certain Blue Shield matters should also be discussed with office employes.

For example, they are offered assistance on how to complete medical service reports briefly yet effectively resulting in more rapid payment by Blue Shield and less correspondence between doctors' offices and Blue Shield.

Other activities of the professional relations program aimed at providing service to physicians include correspondence and telephone information, news releases, and the quarterly bulletins.

Correspondence and telephone information are equally important where subscribers are concerned, for if subscribers receive ample information from Blue Shield regarding the coverage provided by the contracts and other matters, fewer inquiries will be directed to doctors and their office personnel.

Many of the professional relations activities for 1959 have already been planned on the basis of better service to the medical profession through every phase of the professional relations program.

During 1958, the Blue Cross Hospital Relations Department carried out its hospital relations program through various media.

Visits were made to the Blue Cross contracting hospitals to discuss whatever problems might exist between the hospitals and Blue Cross. Every Blue Cross hospital in Minnesota but one was visited personally, and Blue Cross was discussed with every hospital administrator in Minnesota or with responsible people in the hospital.

Meetings were held with a number of hospital boards to discuss the Blue Cross Plan and the hospital's Blue Cross experience.

Member Blue Cross hospitals were invited to hold one of their Board meetings at the Blue Cross office. Two Blue Cross member hospitals, St. Luke's and St. John's, both of St. Paul, held one of their monthly Board meetings at the Blue Cross office, and an educational program on Blue Cross was provided as a part of their Board meeting.

Area meetings were arranged and held for hospital bookkeeping personnel. Two of these meetings were held and so successfully that more meetings of this type are planned for the future. These meetings dealt primarily with the technical problems of Blue Cross coverage and clearance of Blue Cross cases and benefits.

A hospital relations representative attended the district meetings of the Minnesota Hospital Association carried out in various Hospital Association districts in the state, in all instances where Blue Cross was invited to attend. The Blue Cross representative in several instances participated in the meeting and gave a discussion of Blue Cross matters as a part of the program.

Negotiations were carried on with all of the new general hospitals constructed in the state of Minnesota and opened during 1958. Each of these hospitals either requested inclusion in the Blue Cross Plan and was included as a member hospital after completion of the routine requirements and contracts; or is in the process of being included in the Blue Cross Plan upon completion of the necessary requirements and contracts.

Women see physicians more often than men do, especially at the ages of 15 through 44. During childhood, however, boys receive more medical care than girls.

Persons in low-income groups now see a physician almost as often as those in high-income groups, says Health Information Foundation. Thirty years ago, by contrast, high-income families averaged about half again as many visits to doctors as did those with the lowest incomes.

—Health Information Foundation.

even when the causative organism may be a "persistent staph"

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AS PROVED BY success in mixed infections—more than 95% of 1,000 acute and chronic respiratory tract infections were successfully treated; a 99% cure rate was achieved in mixed bacterial pneumonias.†

AS PROVED BY effectiveness in "problem infections"—a response rate better than 96% was recorded in a group of 221 gastrointestinal infections including chronic intestinal amebiasis; 91% of 465 urogenital infections were successfully controlled.†

AS PROVED BY excellent safety record—extremely well tolerated; discontinuance of medication was necessary in only 11 of 3,280 patients.†

A significant number of the above cases had not responded to other antibiotics.

Cosa-Signemycin is particularly valuable in home and office, where susceptibility testing is difficult or impractical.

SUPPLY: *Capsules* (green and white), 250 mg. and 125 mg.
New Oral Suspension (raspberry-flavored), 2 oz. bottle, 125 mg. per teaspoonful (5 cc.).
New Pediatric Drops (raspberry-flavored), 10cc. bottle, 5 mg. per drop, plastic calibrated dropper.

Average dosage: For adults, 1-2 Gm. daily in divided doses; proportionately less for children, depending on age, weight, and severity of infection.

†Literature and bibliography available on request.

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General Interest

Dr. John R. Watson, member of the Olmsted Medical Group, was a recent speaker at a meeting of the Minnesota Obstetrical and Gynecological Society at Mayo Memorial Building in Minneapolis. Dr. Watson's topic was "The Use of Pharyngeal Airway in Premature Breech Delivery."

* * *

The Lake Region Clinic, located previously in the Penney Building, Detroit Lakes, has moved to its new home at 1135 Washington Avenue. Members of the Clinic are **Dr. William C. Dodds, Dr. Virgil A. Watson** and **Dr. Robert N. Watson.** The new building, modern in every detail, covers an area of 4,000 square feet and twenty-two rooms including two waiting rooms. The structure is fully air conditioned and has sound-proof rooms including a lead-lined x-ray room.

Three St. Cloud doctors have begun development of a two-acre tract of land near the airport entrance to be known as "Doctor's Park." Plans are to sell lots for office buildings for doctors, dentists, architects, lawyers, and other professional people. **Dr. William A. Autrey** is associated with **Dr. Henry J. Reif** and **Dr. C. F. Brigham, Jr.,** in the project. Two buildings presently are under construction in the area—one is owned by Drs. Autrey, Reif and Brigham. The other is being constructed by **Dr. Edward M. LaFond.** Dr. Autrey said he and his associates have a five-year option on three adjoining acres of land from the Whitney Land Company, to be developed for the same purposes. The building to be occupied by the associates will contain space for eighteen examining rooms, offices, laboratories, and reception rooms. Dr. LaFond is constructing a three-office building.

* * *

Dr. Robert Cullen, Evansville, Indiana, will be associated with **Dr. John Watkins** in the practice of medicine at the Dr. Watkins Medical Clinic.

* * *

The new hospital at Tyler has been named the **Dr. A. L. Vadheim** Memorial Hospital by action of the Tyler village council. Dr. Vadheim started a five-bed hospital in 1915. It was destroyed by a cyclone in 1918. A second hospital was set up in 1920 and another addition was made in 1938.

* * *

Dr. Morton Roan, former Lamberton and Anoka physician, has established a practice in Ellendale, Minnesota.

* * *

Dr. J. T. Priestley, chairman of the Board of Governors of the Mayo Clinic, head of a section of surgery and professor of surgery in the Mayo Foundation, has been elected president of the Western Surgical Association. He succeeds Dr. James Barrett Brown,, St. Louis surgeon. **Dr. Deward O. Ferris,** a Mayo Clinic staff member, was elected first vice president, succeeding Dr. Philip B. Price, Salt Lake City, Utah. **Dr. O. H. Beahrs,** a member of the Mayo Clinic staff, was elected to membership in the Western Surgical Association. He is head of a section of surgery in the Mayo Clinic and assistant professor of surgery in the Mayo Foundation.

* * *

New Ramsey County Medical Society officers are **Dr. Gordon Kamman,** president; **Dr. Abbott Skinner,** secretary-treasurer; **Dr. Walter Gardner,** president-elect, and **Dr. E. V. Kenefick,** vice president, all from St. Paul.

* * *

Dr. Gordon C. MacRae, Duluth physician and surgeon, has been appointed medical director of the Duluth Rehabilitation center under an annual $5,000 grant from the Sister Elizabeth Kenny Foundation.

* * *

A former Northfield and Roseville physician and surgeon, **Dr. W. G. Larson,** has announced the opening of an office for the practice of medicine in the Kinne Building, 8488 Central Avenue in Spring Lake Park.

* * *

"Safeguarding Our Health" was the topic of an address presented by **Dr. Elizabeth Mussey** of the Mayo Clinic at a recent meeting of the Business and Professional Women's Club in Rochester.

* * *

Dr. J. Arnold Bargen, Rochester, was recently named vice president of the Mississippi Valley Medical Society at that group's annual meeting in Minneapolis.

* * *

Dr. Carl A. Schwartz, former chief of psychiatry at the Anoka State Hospital, has been named psychiatrist for the Mower County Health Clinic.

* * *

The undernoted physicians have been appointed to the medical staff of the Cloquet Community Memorial Hospital. **Drs. John M. Streitz, Kenneth A. Storsteen, Malcolm M. Fifield, John H. Peterson, Thomas O. Young, Robert J. Deutsch, James S. Spang,** and **William M. Spang,** all of Duluth.

* * *

Dr. G. W. Clifford, of the Alexandria Clinic, recently attended an intensive review course in surgery at the Cook County Graduate School of Medicine in Chicago.

* * *

The St. Cloud Medical Group **(Drs. P. L. Halenbeck, R. T. Petersen** and **C. B. Thuringer)** recently moved to its new office building. Two physicians, **Dr. Richard F. Kline** in internal medicine and **Dr. Anthony T. Rozycki** in obstetrics and gynecology, are recent additions to the group.

* * *

Elected recently to the American Academy of Child Psychiatry is **Dr. Jack V. Wallinga,** Minneapolis psychiatrist.

* * *

Dr. John F. Briggs, St. Paul internist and member of the Minnesota Heart Association's executive committee,

spoke to members of the Twin City Coronary Club at its fourth orientation lecture recently. The group is composed of persons who have recovered from heart attacks and returned to normal activities. Members, through physician referrals and with clerical assistance from the Minnesota Heart Association, offer a visiting service to coronary thrombosis victims. Memberships are still available for men and women. Anyone interested in joining should call the Heart Association, MIdway 6-6553.

* * *

Dr. George S. Baker, of the Mayo Clinic medical staff, was elected president of the American Academy of Neurological Surgery at a meeting in Toronto, Ontario. Attending the Toronto meeting with Dr. Baker were **Drs. N. P. Goldstein, N. C. Hill, H. J. Svien, H. R. Terry,** and **Alfred Uihlein.**

* * *

Consulting psychiatrist of the Willmar Mental Health Clinic is **Dr. George Dorsey.** Other members of the team are **Dr. P. V. Mehmel,** clinical psychologist, and **Elwyn Wenger,** psychiatric social worker.

* * *

Dr. G. Keith Stillwell, Rochester, has been named president of the Minnesota Rehabilitation Association. Elected members of the advisory board were **Dr. Glenn Gullickson,** Minneapolis, and **Dr. Frank H. Krusen,** Rochester.

Dr. Henry Woltman, retired head of the section of neurology and psychiatry at the Mayo Clinic, who is now in neurology at Rochester State Hospital, was one of about twelve neurologists and neuro-physiologists selected by the U. S. Public Health Service to make a month-long observation trip to Russia. The group will study various Russian institutes of research and training and will also give lectures.

* * *

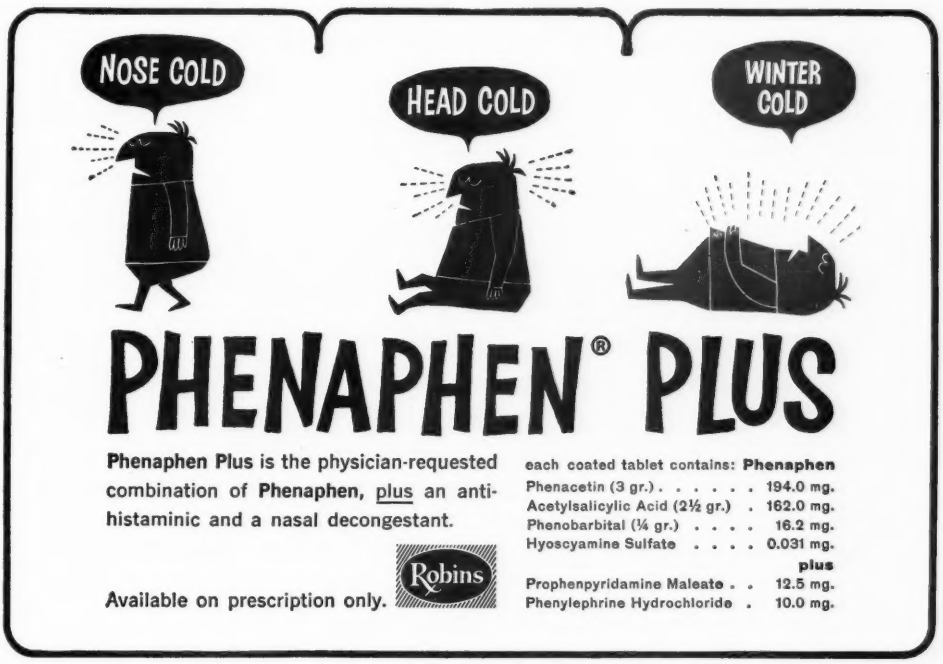
An institute for public health nurses on common emotional problems of school-age children was held December 4-5 at the University of Minnesota Center for Continuation Study. Chief resource person was **Dr. Paul F. Wilson,** director of the mental health clinic, Rochester-Olmsted County Health Center. Dr. Wilson discussed needs and feelings of school-age children, and the problems which may arise.

* * *

Dr. Albert V. Stoesser was guest speaker at the fall meeting of the Tri-County Society (Eau Claire-Dunn-Pepin Medical Society) held at Menomonie, Wisconsin, November 22, 1958. The subject of his talk was "The Proper Handling of the Allergic Manifestations in Infancy and Childhood."

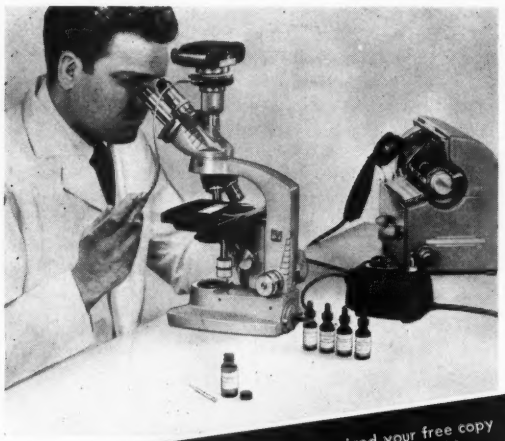
* * *

Dr. Thomas B. Magath, Senior Consultant in Clinical Pathology, Mayo Clinic and Professor of Clinical Pathology, Mayo Foundation, University of Minnesota, was awarded the Ward Burdick gold medal "for the



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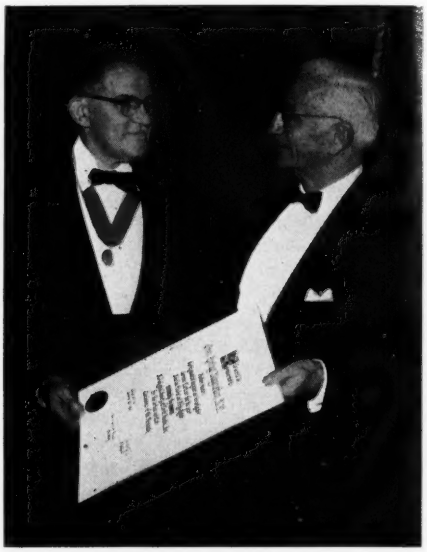
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most meritorious contribution to Clinical Pathology at the recent meeting of the American Society of Clinical Pathologists. He delivered the Ward Burdick lecture on "The Antigen of Echinococcus."

* * *



Dr. Owen H. Wangensteen *(right)* Minneapolis, Professor of Surgery, University of Minnesota School of Medicine, received a scroll commemorating his Carman Lecture at the 44th annual meeting of the Radiological Society of North America, November 16-21, 1958, in Chicago. Dr. Leo G. Gigler, Los Angeles, California, Society President, is shown extending congratulations. Dr. Rigler formerly was a colleague of Dr. Wangensteen's at the University of Minnesota before moving to Los Angeles. The Carman Lecture is the scientific highlight of the Radiological Society's annual convention. Dr. Wangensteen's topic for the 1958 Lecture was "Carcinoma of the Stomach."

* * *

Dr. Raymond D. Pruitt, consultant in medicine in the Mayo Clinic, Rochester, Minnesota, and professor of medicine in the Mayo Foundation, Graduate School, University of Minnesota, has been appointed secretary of the Minnesota Rhodes Scholarship Selection Committee. This committee will interview Minnesota candidates for Rhodes scholarships.

The average person today sees his doctor about five times a year, Health Information Foundation reports. In the aggregate, Americans use between 800 and 850 million physician visits a year.

Communications

This Section is for you to voice your convictions, comments, and queries on all subjects political, economic, historic, humorous, scientific or otherwise, to many physicians. Writings not sufficiently formal and too brief for an editorial or a scientific manuscript are requested. Clinical and research observations, no matter how brief, similar to those in *The Lancet* (London), are particularly encouraged.

RECALCITRANT UNIT AT ANOKA

On October 29, 1958, the Minnesota Department of Welfare announced the availability of the Recalcitrant Unit at the Anoka State Hospital, for caring for irresponsible people with active tuberculosis who by their conduct endanger the health of others. The philosophy and procedures for admission of patient to the Unit were described in a Memorandum from the Department.†

In summary, any health officer may report his knowledge of a recalcitrant tuberculosis case to the board of county commissioners or the District Court. Through the board or the court, such recalcitrant person may be given a fair hearing and committed to a designated tuberculosis sanatorium, including the Recalcitrant Unit. If necessary, the recalcitrant patient may be admitted to the Anoka State Hospital, upon making arrangements with the Superintendent, and kept there as long as necessary.

Physicians and others concerned with cases of tuberculosis who may be endangering the public's health may wish to know of this development. For further information about procedures, the physician should consult his local or state health department, tuberculosis sanatorium, the State Department of Welfare, or the Anoka State Hospital.

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†See page 65.

MINNESOTA MEDICINE—FIRST

In reply to your letter of November 20, 1958, following is a report for MINNESOTA MEDICINE:

January through October, 1958 (ten months' net revenue $52,231.15)—percentage gain over same period of 1957 is 40.2 per cent.

The average gain for the thirty-three journals we serve is 23.9 per cent. MINNESOTA MEDICINE has enjoyed the highest gain of any of our publications; none of them have an average above 29 per cent gain. This is fabulous since no other medical journal can report the increase outlined above.

I cannot make a prediction for 1959, since many advertising schedules have not been released to date. I do expect we shall hold 1957 billing figures and possibly 1958 figures.

Sincerely yours,
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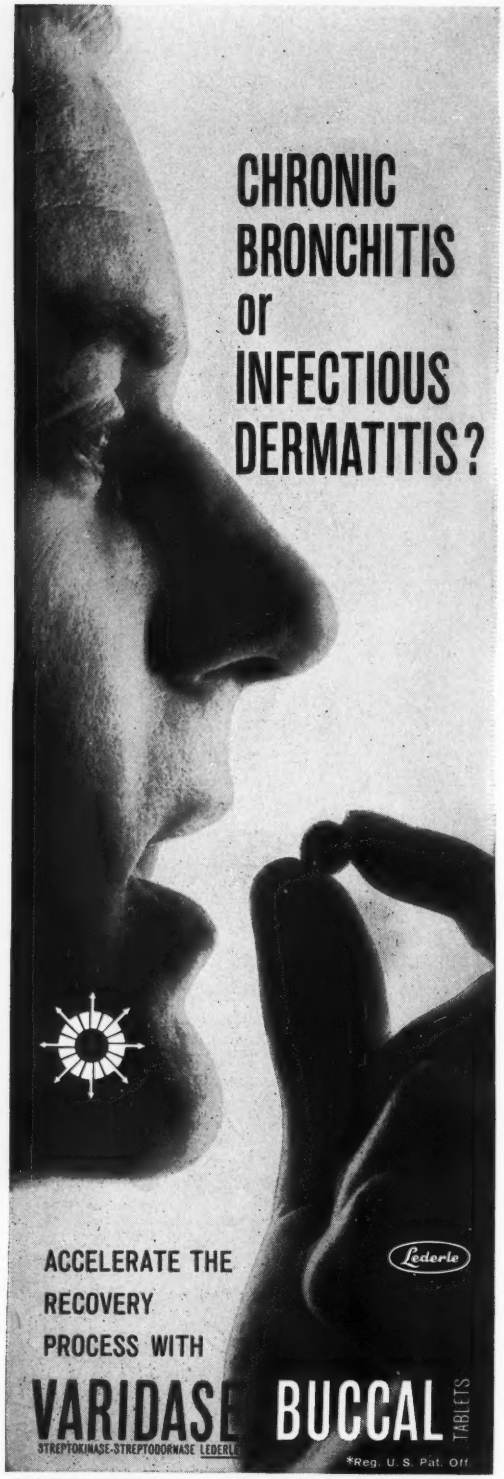
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Calcium Pyrophosphate (Ca 150 mg., P 120 mg.), 7½ gr.
Ferrous Sulfate USP (Fe 38 mg.) 3 gr. 3.8 M.D.R.
Vitamin A (Ester) 1500 USP Units ⅜ M.D.R.
Vitamin D (Irradiated Ergosterol) 200 USP Units ½ M.D.R.
Thiamine Mononitrate (B_1) 1 mg. 1 M.D.R.
Riboflavin (B_2) . . . . 2 mg. 2 M.D.R.
Ascorbic Acid (C) 16.66 mg. ½ M.D.R.
Vitamin E . . . . . 2.2 I.U.* (from d alpha tocopheryl acetate N.F.)
M. D. R. — Minimum Daily Requirement. *M.D.R. not established.
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Book Reviews

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

A DOCTOR SPEAKS HIS MIND. By Roger I. Lee. 120 pages. Portrait. Boston and Toronto: Little, Brown and Company, 1958. Price, $3.00.

Dr. Lee records his thoughts and philosophies concerning many matters in this little volume. His writing style is simple and direct. The subjects are interesting and his comments to the point. The book can be recommended for pleasant reading.

JOHN F. BRIGGS, M.D.

RADIOACTIVE ISOTOPES IN CLINICAL PRACTICE. By Edith H. Quimby, Sc.D., Sergei Feitelberg, M.D., and Soloman Silver, M.D. Philadelphia: Lea & Febiger, 1958. 451 pages. Price $10.00.

This book is commendable for its lucid arrangement into three major divisions on basic physics, instrumentation, and clinical applications; and, a logical breakdown of these again into numerous subheadings. The author of the first portion is this country's most distinguished interpreter of radiation physics, Dr. Edith Quimby. Her discrimination between what is and is not important is founded on many years of teaching the subject to physicians as well as examining candidates who appear before the American Board of Radiology. Some of the subjects treated are: fission, production of radioisotopes, nuclear reactions, modes of radioactive decay, interaction of radiation and matter, and radiation hazards. There is an important chapter on dosage calculation which, unfortunately, is too complex for the average physician to comprehend completely.

In the second portion, Feitelberg describes the different methods of detecting and measuring radiation, with the special problems involving various beta and gamma emitters inside and outside the body. He warns against certain assumptions on the part of beginners which will lead to erroneous results.

The third portion makes no attempt to be encyclopedic, but, in the words of the author, is limited to "those isotopes and their applications which actually are being used in medical practice and have a demonstrated usefulness." Different isotope-users are apt to interpret this thesis differently; but, in general, Silver displays admirable restraint. It is important for a writer on this subject to avoid undue enthusiasm for procedures which turn out to be mere novelties. The use of radio-iodine in thyroid disorders is thoroughly discussed on the basis of many years' experience. The fascinating fact of erroneous high uptake by the thyroid, which is bound to stump every isotopist sooner or later, is explored and explained. The author might have been more critical

of isotope cardiac output studies and of results claimed for treatment of carcinomatous effusions with radiogold.

There are now six contemporary American textbooks in the field of nuclear medicine. The brevity and clarity of this volume makes it particularly satisfying both for teaching the fundamentals of the subject and as a reference.

ELMER C. PAULSON, M.D.

MICRODIFFUSION ANALYSIS AND VOLUMETRIC ERROR, 4th Ed. By Edward J. Conway. 466 pages. Price, $8.50. New York: The Macmillan Company, 1958.

Written for laboratory analysts and technicians, chemists and biochemists, medical technicians, clinicians and pharmacists, students and teachers, this is a necessary book for every analyst's laboratory and a source of ideas for all interested in accurate small-scale analysis. An up-to-date and vastly improved edition of a classic work, it includes a section on apparatus and principles used in microdiffusion analysis, an account of laboratory methods, and a new treatment of volumetric error with particular reference to micro-quantities.

BOOKS RECEIVED

PRACTICAL LEADS TO PUZZLING DIAGNOSES. Neuroses That Run Through Families. Walter C. Alvarez, M.D., D.Sc. Emeritus Professor of Medicine, University of Minnesota (Mayo Foundation). 490 pages. Price $9.00, cloth. Philadelphia: J. B. Lippincott Co., 1958.

CLINICAL OBSTETRICS AND GYNECOLOGY. Abnormal Uterine Bleeding, Edited by John I. Brewer, M.D.; Special Diagnostic Aids, Edited by C. Paul Hodkinson, M.D. Vol. 1, No. 3. 308 pages. Illus. Price $18.00 for series of four volumes. New York: Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers, 1958.

LESIONS OF THE LOWER BOWEL. Raymond J. Jackman, M.D., M.S., in Proctology. Section of Proctology, Mayo Clinic, and Associate Professor of Proctology, Mayo Foundation, Graduate School, University of Minnesota. 347 pages. Illus. Price $15.50, cloth. Springfield, Illinois: Charles C Thomas, 1958.

THE BIRTH OF NORMAL BABIES. Lyon P. Strean, M.Sc., Ph.D., D.D.S., F.A.P.H.A. Consultant, Norristown State Hospital, Norristown, Pennsylvania; Consultant, Montgomery Hospital, Norristown, Pennsylvania. 194 pages. Price $3.95, cloth. New York: Twayne Publishers, Inc., 1958.

PEDIATRIC METHODS AND STANDARDS. Third Edition. Editor, Fred H. Harvie, M.D. Associate Professor of Clinical Pediatrics, Department of Pediatrics, School of Medicine, University of Pennsylvania. 324 pages. Illus. Price $4.50, flexible. Philadelphia: Lea & Febiger, 1958.

BREAST CANCER. The Second Biennial Louisiana Cancer Conference. Edited by Albert Segaloff, M.D. Dir. of Endocrine Research, Alton Ochsner Medical Foundation; Associate Professor of Clinical Medicine, Tulane University School of Medicine. 257 pages. Illus. Price $5.00, cloth. St. Louis: C. V. Mosby Co., 1958.

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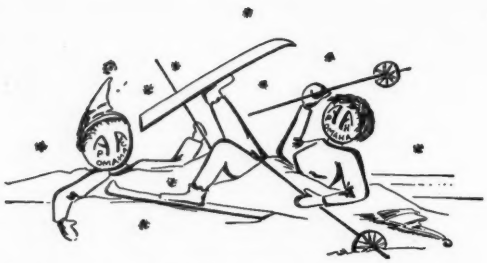
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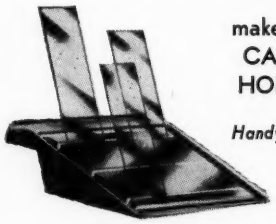
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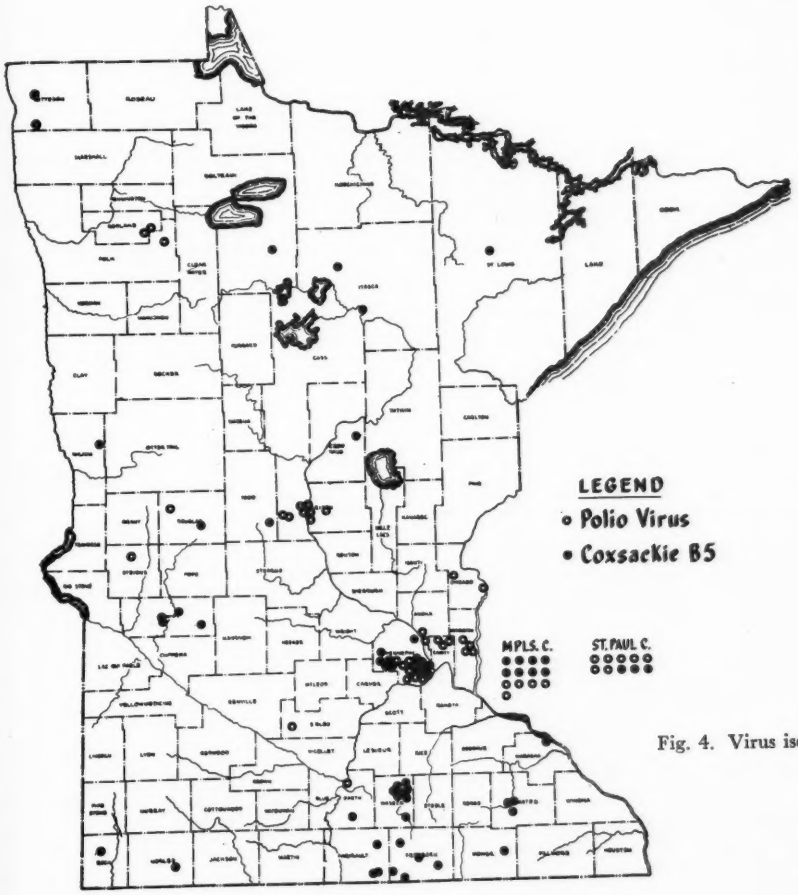


Fig. 4. Virus isolations, Minnesota, 1956.

HERMAN KLEINMAN, M.D.
Minneapolis, Minnesota

Dr. Kleinman is Chief, Section of Chronic Diseases, Minnesota Department of Health.

IN the broadest sense, all virus diseases are of some current interest; if not because of high incidence, then because of other important aspects. Rabies and poliomyelitis are examples of virus diseases where immunization procedures are of current importance because of new concepts and new procedures. Influenza has been of current

Presented at the Annual Meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, May 23, 1958.

interest because of a recent epidemic due to a new, the Asian, strain, and also because of the immunization problem involved.

However, the greatest sustained interest rests with those diseases associated with the family of viruses known as the enteroviruses. This field is moving fast because of the refinement and expansion of tissue culture techniques. Minnesota in the past three years has for each separate year had experience with diseases similar in symptomatology, but in each instance due to a different virus. This family of viruses and the human diseases with which they are associated are listed in Table I. It should be noted that there is no group in this family in which some types have not been implicated in the aseptic meningitis syndrome. In addition, ECHO virus types 4, 9, and 16, have been associated with summer exanthematous disease.[1,2]

TABLE I. ASSOCIATION OF ENTEROVIRUSES WITH HUMAN DISEASE

Enteroviruses	Associated Disease
Poliovirus	Paralysis (complete to slight muscle weakness) Aseptic meningitis Undifferentiated febrile illness, particularly during the summer
Coxsackie viruses, Group A	Herpangina Undifferentiated febrile illness, particularly during the summer Aseptic meningitis (Types A7, A9)
Coxsackie viruses, Group B	Aseptic meningitis Pleurodynia Myocarditis or encephalomyocarditis during neonatal period and early childhood Mild paralysis (?)
ECHO viruses	Aseptic meningitis (Types 2, 3, 4, 5, 6, 9, 14, 16) Summer rash (Types 4, 9, 16*) Summer febrile illness Mild paralysis (?) (Type 6) Summer diarrhea of infants and children (Type 18 and others)

*Neva has found the etiologic agent of Boston exanthem to be antigenically related to ECHO virus Type 16.

It should be understood at this point that the term *aseptic meningitis* is used in its presently accepted sense. That is, the term applies not to a specific disease entity but represents a syndrome common to many etiologies. The most characteristic symptoms and signs of this syndrome are fever, headache, nuchal rigidity, back rigidity, and changes in the cerebrospinal fluid consisting of a pleocytosis with the lymphocyte as the predominant cell. The responsibile agents include both bacteria such as the tubercle bacillus and leptospirae as well as a variety of viruses. It is the latter group, the viruses, which will be considered here. The term, too, is overcoming some of its early unsavory reputation as a diagnostic wastebasket mainly because recent work in virus laboratories has enabled some groups of this syndrome to be lifted out of the "etiology undetermined" class. It is apparently respectable to be called aseptic meningitis if the parents are known. The diagnosis of ECHO 9 aseptic meningitis has as much nosologic validity as does the diagnosis, meningococcus meningitis.

Virus isolations effected in Minnesota from 1955 to 1957 are listed in Table II. As is apparent from Table II the agent responsible for the viral central nervous system disease that occurred in Minnesota in 1955 was the poliovirus. In 1956, while poliovirus was still operative, Coxsackie B5 virus was isolated from cases of central nervous system disease more frequently than was any type of poliovirus. In 1957 the predominant virus by far was another and for Minnesota, a new one, ECHO 9 virus. It is reasonable to suppose that the Coxsackie B5 virus was not present in Minnesota, at least in readily detectable amount, in 1955 because the isolation techniques used in 1956 were the same as those used in 1955 and the virus would have been picked up had it been there. The

TABLE II. VIRUS ISOLATIONS IN MINNESOTA 1955-1957* (PATIENTS)

	1955	1956	1957
Poliovirus (all types)	175	47	9
Coxsackie B5		60	18
ECHO 9			120+
Others	27	5	†(17)

*The virus isolations in this table represent the combined results of the laboratories of the Minnesota Department of Health and the laboratories of Dr. J. T. Syverton, Professor and Head, Department of Bacteriology and Immunology, University of Minnesota.

†All not yet completely identified.

TABLE III. VIRAL DISEASES OF THE CENTRAL NERVOUS SYSTEM Minnesota, 1955-1957

Diagnosis	1955	1956	1957*
Paralytic polio	207	67	30
Nonparalytic polio	288	82	24
Mumps meningo-encephalitis	25	19	16
Coxsackie B5 aseptic meningitis		75	21
ECHO 9 aseptic meningitis			174
Western equine encephalitis		2	
St. Louis encephalitis		3	
Lymphocytic choriomeningitis	5	11	2
Aseptic meningitis, cause undetermined†	47	78	421

*Data provisional.

†Includes encephalitis and meningo-encephalitis of unknown etiology.

ECHO 9 virus can be detected in monkey kidney tissue cell culture but not in the HeLa cell cultures routinely used in Minnesota for poliovirus and Coxsackie virus isolation. Though this virus may have been present to some extent in Minnesota in 1955 and 1956, there is good epidemiologic evidence to believe that it made its first clinical appearance in 1957.

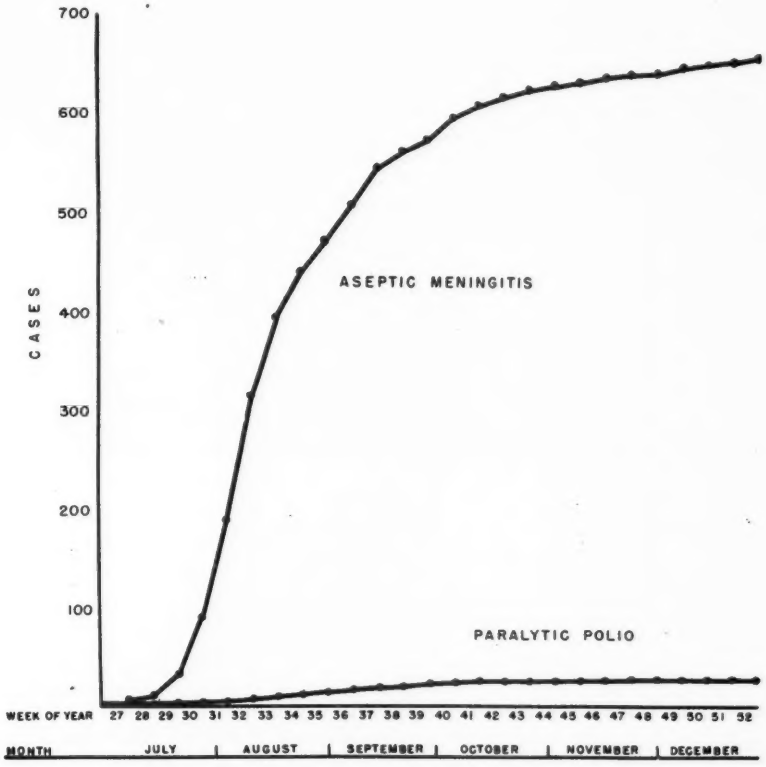


Fig. 1. Cumulative incidence, aseptic meningitis and paralytic polio, Minnesota, 1957.

A more comprehensive view of Minnesota's experience with viral central nervous system disease is presented in Table III. This table lists the diseases by name and includes more than those cases which were characterized by the isolation of the etiologic agent. These additional cases were admitted to the different diagnostic categories on various grounds. In some instances the evidence for admission was serologic; in others it was epidemiologic; and some cases were classified solely on clinical grounds if these were reasonably sound. This last group naturally includes cases that were subjected to the exclusion process for final diagnosis. But no case was finally classified until all the laboratory and historic data were available for a critical appraisal. In many instances, the ultimate decision was not made until after consultation with the original attending physician in order to secure the benefit both of his retrospective thinking and any additional observations he might have made subsequent to the period of the acute illness. The table does not include postinfectious encephalitis such as occurs after measles, rubella, chickenpox, et cetera.

It is possible from the data of Table III to appreciate the extent and the nature of the viral central nervous system disease problem as it existed in Minnesota from 1955 to 1957. It is obvious that the arthropod-borne encephalitides pose no problem. The few cases listed were diagnosed on the basis of serologic results. It is interesting to note that two of the patients having St. Louis encephalitis most probably acquired their infections while on visits to Nebraska. These cases must be

considered entirely sporadic in nature. None of them was characterized by profound disturbances of consciousness although lethargy was mentioned as a symptom. Lymphocytic choriomeningitis occurred with more frequency but was still of minor incidence. These cases, too, were admitted on the basis of serologic evidence but in one instance the virus was isolated from the cerebrospinal fluid. Mumps meningo-encephalitis occurred with regularity throughout the three years. This is a well-defined entity which yields almost invariably good serologic responses which in themselves are diagnostic. Parotitis is not always present; in fact, it is absent in somewhat less than half the cases.

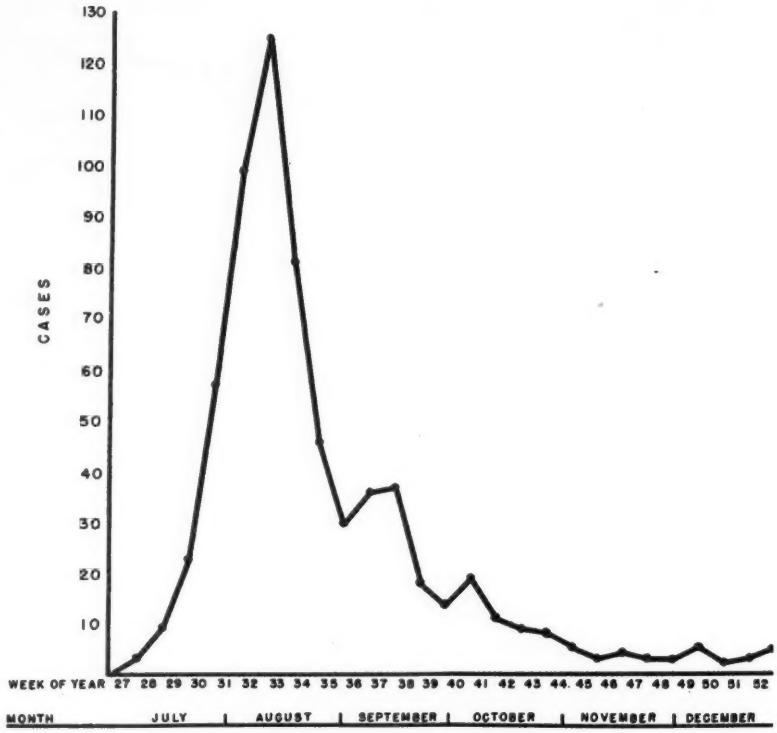


Fig. 2. Epidemic curve, aseptic meningitis, Minnesota, 1957.

The conditions, then, which remain as the bulk of the experience in aseptic meningitis are poliomyelitis, Coxsackie B5 aseptic meningitis, ECHO 9 aseptic meningitis, and aseptic meningitis of undetermined cause.

Quite definitely 1955 was a poliomyelitis year even though the total incidence was low. Poliomyelitis in 1956 was of still lower incidence but in this year there was a definite outbreak of aseptic meningitis due to Coxsackie B5 virus.[3] Considering that thirty-two of the finally accepted cases of Coxsackie B5 infection were initially reported as nonparalytic poliomyelitis, it can be said that during 1956 the reporting of nonparalytic poliomyelitis was attended by an error of 29 per cent. This, of course, in no way reflects on the diagnostic acumen of the attending physician. If the Coxsackie B5 outbreak was considered striking, the epidemic of ECHO 9 aseptic meningitis in 1957 was truly dramatic.[4]

While both of these events, the Coxsackie B5 and the ECHO 9 occurrences, were in time settled on a sound virologic basis, the presence of something unusual was preliminarily suspected on purely epidemiologic grounds. In August of 1956 a cluster of reports of nonparalytic poliomyelitis was noted to be accumulating in certain areas of the state without mention of paralytic disease originating from the same areas. These areas were almost exclusively confined to a few counties in the south-central region of the state. Along with this, the laboratory was reporting the isolation of

cytopathogenic agents, not poliovirus, from the cases in these same areas. It was thus an epidemiologic probability and a laboratory certainty that something besides poliomyelitis was occurring.

meningitis, suspected nonparalytic poliomyelitis, viral meningo-encephalitis, and others. What happened to this group as laboratory evidence accumulated is shown in the last column of Table

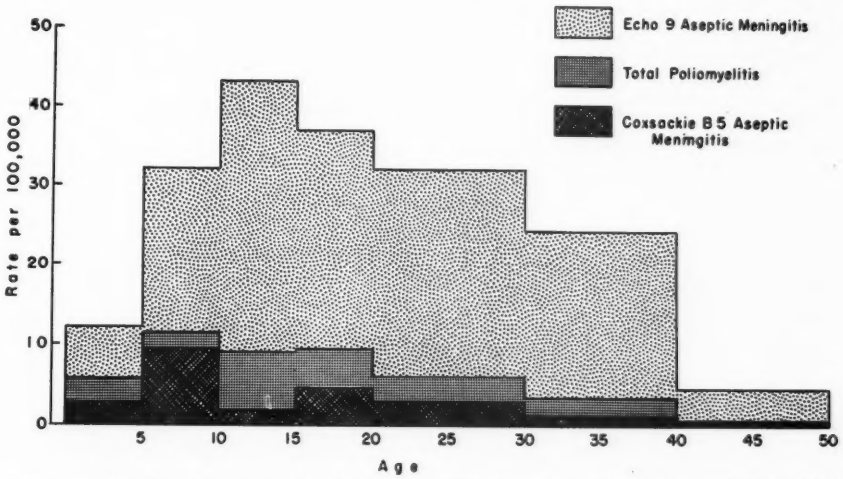


Fig. 3. Age distribution, total poliomyelitis, 1956, Coxsackie B5 aseptic meningitis, 1956, and ECHO 9 aseptic meningitis, 1957, Minnesota.

The ECHO 9 occurrence was suspected even earlier. By the end of July in 1957 the disproportion between nonparalytic and paralytic disease of the central nervous system was so great as to constitute *prima facie* evidence that the nonparalyzing aseptic meningitis was not poliomyelitis. In addition, the appearance of a rash in a certain percentage of the cases made it quite certain that a new disease entity was attacking the population—a disease entity that was not poliomyelitis and not Coxsackie B5 aseptic meningitis (Fig. 1).

The raw data behind the title line "aseptic meningitis, etiology undetermined" in Table III yield the evidence for an interesting reporting phenomenon referred to earlier. In 1955, the forty-seven cases finally comprising this category were originally reported as fifteen cases of suspected poliomyelitis, thirty cases of nonparalytic poliomyelitis, one case of Western equine encephalitis and only one case of aseptic meningitis as such. It was easy to rule out poliomytlitis and encephalitis in these cases as the sera from these patients contained no antibodies against the diseases mentioned in the original reports. In 1957, apparently bearing the Coxsackie B5 experience of 1956 in mind, physicians reported a total of 658 cases under various designations such as aseptic III (paralytic poliomyelitis excepted). As more laboratory evidence becomes available the total of the remaining cases still carried as "aseptic meningitis, cause undetermined" will be whittled down still further and assigned to other and more definite categories. Undoubtedly most of them will be classified as ECHO 9 infections. The increased reluctance of physicians to make the diagnosis of nonparalytic poliomyelitis is thus readily apparent. This reluctance is also evident in considering the proportion of poliomyelitis cases reported as nonparalytic in the three years from 1955 to 1957. In 1955, 68 per cent of the accepted cases of poliomyelitis were listed as nonparalytic; in 1956 the proportion was 55 per cent; in 1957 there were equal proportions of paralytic and nonparalytic poliomyelitis reported.

The diagnostic dilemma of the practicing physician can be profound and troublesome. The season of occurrence is of no diagnostic help to him except for mumps meningo-encephalitis. This condition does tend to occur more frequently in the spring of the year well in advance of the usual poliomyelitis season. Also the presence of parotitis and/or orchitis may make the diagnosis self-evident. But nonparalytic poliomyelitis, Coxsackie B5 aseptic meningitis and ECHO 9 disease all oc-

TABLE IV. ATTACK RATES BY AGE PER 100,000 FOR NONPARALYTIC POLIOMYELITIS, 1956; COXSACKIE B5 ASEPTIC MENINGITIS, 1956; AND ECHO 9 ASEPTIC MENINGITIS, 1957
Minnesota (based on reports)

Age	Nonparalytic Polio 1956	Coxsackie B5 1956	ECHO 9 1957
0- 4	2.1	2.7	12.2
5- 9	6.2	9.9	32.2
10-14	5.0	1.9	43.5
15-19	5.3	4.8	36.9
20-29	3.5	2.4	32.1
30-39	2.5	1.1	24.5
40 and over	.3	.3	4.5

cur during the same time of the year. In Minnesota, in 1955, poliomyelitis peaked during the first half of August. In 1956 both poliomyelitis and Coxsackie B5 meningitis peaked during the second half of August. The ECHO 9 aseptic meningitis of 1957 showed its peak during the second week of August (Fig. 2).

The age distribution of these three conditions is interesting, and is shown in Table IV and Figure 3. The age distribution curve for nonparalytic poliomyelitis and Coxsackie B5 are similar in that they show the highest incidence in the earlier years of life. This is characteristic of a population where childhood experience with a disease results in relative immunity for the more adult sections of that population. The situation with respect to ECHO 9 aseptic meningitis is different. Here the attack rates for ages five to forty are similar enough in magnitude to give to the curve of distribution a definite segment of plateau-like flatness. The lower rates under five and over forty might very well be due to differences in exposure potential. This strongly suggests that adults in Minnesota had had no previous immunizing experience with ECHO 9 virus and that consequently this infection was new to the state.

Geographically, in Minnesota poliomyelitis has tended to occur in more or less well-defined clusters. In 1955, for example, it was possible to map out six restricted areas where there were concentrations of cases. In 1956, with a lower incidence of poliomyelitis, it was still possible to demonstrate localization into three spots. The Coxsackie B5 outbreak was also well localized in that it occurred principally in the south-central counties of Minnesota and here principally in two counties. This is not difficult to understand if one considers the Minnesota experience merely a northward extension of what had been happening to a greater extent in Iowa. The geographical separation of the poliovirus and Coxsackie B5 virus that year was sharp. Poliovirus was not recovered from cases in those areas where Coxsackie B5 virus was being found and conversely where there was Coxsackie B5 virus, there was no poliovirus (Fig. 4).* The epidemic of ECHO 9 aceptic meningitis of 1957 was most intensively studied in the Twin Cities area but there is good reason to believe that this infection was widespread throughout the state. The poliomyelitis experience in Minnesota for 1957 was quite small and the cases appear to be confined to the areas of greatest population density.

Clinically, aseptic meningitis due to Coxsackie B5 virus and nonparalytic poliomyelitis cannot be told apart. The signs, symptoms and cerebral spinal fluid findings cannot serve to distinguish between the two.[3] ECHO 9 aseptic meningitis, however, does have several very suggestive clinical characteristics. Foremost is the exanthem which may occur in approximately 30 per cent of the cases. This rash has been described a number of times elsewhere.[4,5] It is sufficient to say here that it is maculopapular in nature, it is often transient and it resembles rubella but without any characteristic lymphadenopathy. The headache in ECHO 9 aseptic meningitis is often exceptionally severe. In the Minnesota series the headache was described as severe in 42 per cent of the cases. The headache was so characterized spontaneously, without the leading question being asked. One pediatrician reported the unusual fact that patients as young as three years of age had complained of headache. A woman patient averred that she would much rather endure an episode of migraine, to which she was subject, than the headache associated with this disease. Indeed, physicians often stated that they had had to resort to prescribing Demerol or morphine for relief of the pain. In the cerebrospinal fluid, the number of cells per cubic millimeter is more often over 300 and definitely more often over 1000 as compared to the cell counts in poliomyelitis and Coxsackie B5 aseptic meningitis.[4]

An important aspect of the study of this epidemic consisted of visits to the families of the reported index cases in Hennepin and Ramsey counties. These families were queried as to the existence of concurrent and similar illness among the various household members. The results of these visits, although not yet completely analyzed, support the observation that multiple cases of illness did occur within single households. The data also

*See page 75.

indicate that the disease spectrum was wide. In many cases of concurrent illness, the symptom constellations did not include stiff neck or stiff back. A rash was described as occurring with a mild set of symptoms as well as with a severe set which included all the signs of meningeal irritation. Finally, in some cases the whole disease was represented only by a fever and rash.

In Minneapolis, for example, of 416 household exposures to an index case, there were 168 instances of illness occurring within thirty days before or after the onset of the illness in the index case. Of these 168 patients, eighty-two were males and eighty-six females; 104 had either headache, stiff neck, or stiff back; eighty-three were reported to have had fever; sixty had nausea, vomiting, diarrhea, and abdominal pain; thirty-five had sore throat; and twenty-seven had a rash. The secondary attack rate thus comes out to at least 25 per cent and at most 40 per cent—a remarkably high secondary attack rate.

These calculated secondary attack rates as well as the empirical observation of the widespread nature of this disease quite naturally inspired a number of questions: *Just how extensive was this outbreak? How many people did it really involve?* An attempt was made to answer these questions by designing a statistical survey to sample populations in Ramsey and Hennepin counties. Practical difficulties presented its extension to other parts of the state. While the results obtained are not strictly applicable to the whole state, they do permit a reasonable overall approximation.

The results of this survey are shown in Table V and represent the best estimate we have at present of the actual incidence of ECHO 9 disease, as it occurred in Hennepin and Ramsey counties from July 1, 1957 to September 20, 1957. Table V also compares the proportions of estimated cases in various localities to the proportions of reported cases in these same localities. As can be seen, except for one area, the concordance is very good. These agreements support the view that the estimates are the reasonable result of a valid method. In fact, physicians to whom these results were reported preliminarily showed no surprise at the magnitude of the estimates. Their own experience as well as the experience of their colleagues did not lead them to believe that the figures were disproportionate in any direction.

TABLE V. ESTIMATED AND REPORTED INCIDENCE OF ASEPTIC MENINGITIS (ECHO 9)
Minnesota, 1957, Hennepin and Ramsey Counties

	Estimated Population	Estimated Cases	Per Cent of Estimated Total	Reported Cases	Per Cent of Reported Total
Hennepin County					
Minneapolis	552,000	91,061	41.3	127	43.0
Bloomington	35,000	17,888	8.1	22	7.5
Richfield	37,000	15,857	7.2	15	5.1
St. Louis Park	39,200	9,800	4.4	5	1.7
Other county areas	133,510	23,423	10.6	56	19.0
Total	796,710	158,029	71.6	225	76.3
Ramsey County					
St. Paul	336,000	45,073	20.4	60	20.3
Roseville	29,800	10,927	5.0	3	1.0
Other county areas	77,811	6,642	3.0	7	2.4
Total	443,611	62,642	28.4	70	23.7
Total	1,240,321	220,671	100	295	100

The cases reported in Hennepin and Ramsey counties represented 52 per cent of the total reports. Using this as a factor and projecting the two-county estimate to the state as a whole, it would appear that the total state incidence was 424,367 cases. Such a projected estimate, however, is not as secure as is the two-county estimate because the attack rates in other areas of the state, especially in truly rural areas, may have differed from the attack rates in the metropolitan area.[4]

Minnesota was able to study these outbreaks in a more or less complete manner because of the existence of its poliomyelitis surveillance unit. The methods developed by this unit were immediately adaptable to the study of other aseptic meningitides whenever they occurred. The poliomyelitis surveillance unit of the Minnesota Department of Health was established in 1955 for the express purpose of watching with considerable epidemiologic and laboratory detail, the course of

poliomyelitis as it might be influenced by the Salk vaccine which came into first use in Minnesota during 1955. This basic purpose was followed in 1956 and in 1957. But the inevitable march of events forced this unit into excursions into the field of aseptic meningitis due to viruses other than the poliovirus. In fact, it was surveillance routine that enabled the early appreciation of the existence of these problems. Had it not been so, the studies on Coxsackie B5 and ECHO 9 aseptic meningitis would have been retrospective, a distinct disadvantage.

The dynamism in the enterovirus field will require physicians, laboratory workers, and public health workers to reorient themselves and be prepared to work toward a further reduction in the size of the "cause undetermined" category of virus diseases particularly in that class known as aseptic meningitis. More emphasis will have to be placed on the need for establishing an etiologic diagnosis in individual cases. Perhaps the most important guidepost for the physician is the pattern of central nervous system disease which is occurring in his community. Should it be noted that there is a series of such cases occurring in a community with none of them, or a disproportionately small number of them, showing any lower motor neuron paralysis, then it is proper to infer that the disease which is occurring with major frequency is not poliomyelitis. This is the time to bend every effort towards establishing a definite etiology. From the laboratory standpoint the isolation of the offending agent in the great majority of instances can be made from the stool. Such specimens should be collected as early as possible in the course of the disease as the chances for successful isolation depreciate after the first ten to fourteen days. In addition to this, paired blood samples should be submitted; the first of these drawn preferably within the first five days of onset and the second drawn during the convalescent period about two weeks later.

It will be desirable to try and establish the presence, if any, of any long term effects of such diseases. This can be determined with greatest accuracy by long term follow-up of patients who are known to have had the disease currently or in the recent past. As time goes by the information from retrospective studies becomes more vague, more difficult to interpret and finally quite useless. Sabin has pointed out, on the basis of serological studies, that women of childbearing age are particularly vulnerable to ECHO 9 infection should it be present in any community.[5] *Are pregnant women more susceptible really as they seem to be in the case of poliomyelitis and if infected will there be any effect on the fetus?* The similarity of the ECHO 9 rash and the rash of rubella increases the provocativeness of this conjecture. Another question relates to the relative antiquity of these infections. As we merely becoming newly acquainted with old neighbors?

Finally, from the administrative standpoint, it has been suggested that in the future poliomyelitis be reported as such only when the disease is paralytic and that all nonparalytic conditions be reported under some general term such as aseptic meningitis. At a later date, then, the aseptic meningitis report could be qualified by designating the etiology, if it can be determined. This scheme certainly seems reasonable under present circumstances and would have the merit of bringing to the attention of health departments and epidemiologists cases which might remain unknown because the present regulations do not require a report. This procedure, too, fits in with the present diagnostic temper of physicians.

These are complex questions and the quickest results will be obtained by promoting a closer working relationship between the practicing physician and the public health departments.

References

1. Committee on the Enteroviruses, National Foundation for Infantile Paralysis: The Enteroviruses. Am. J. Pub. Health, 47:1556, 1957.
2. Prince, J. T., St. Geme, Jr., J. W., and Scherer, W F.: ECHO 9 virus exanthem. J.A.M.A., 167: 691 (June 7) 1958.
3. Syverton, J. T., McLean, D. M., Martins da Silva, M., Doany, H. B., Cooney, M., Kleinman, H., and Bauer, H.: Outbreak of aseptic meningitis caused by Coxsackie B5 virus. J.A.M.A., 164:2015, 1957.
4. Kleinman, H., Rogers, D., Ellwood, P. M., Jr., Bruhl, H., Schuman, L. M., and Bauer, H.: Epidemic of ECHO 9 aseptic meningitis in Minnesota, 1957. Univ. Minnesota M. Bull., 29:306. No. 10 (March 15) 1958.
5. Sabin, A. B., Krumbiegel, L. R., and Wigard, R.: ECHO type 9 virus disease: Virologically controlled clinical and epidemiologic observations during 1957 epidemic in Milwaukee. A.M.A. J. Dis. Child., 96: 197-219 (Aug.) 1958.

The Response to the Controlled Infection by Attenuated Poliomyelitis Virus

In the Neonatal Period and Early Infancy

● *Adequate titers of poliomyelitis antibodies can be obtained in women, during pregnancy, by injecting them intradermally with an amount of Salk vaccine five times smaller than the usual subcutaneous dose. The infant eliminates, in about five weeks, half of the antibodies received at birth. Placentally transferred passive immunity to poliomyelitis can be converted to active lasting immunity by the oral administration of live attenuated poliovirus vaccine to newborn infants before leaving the hospital nursery.*

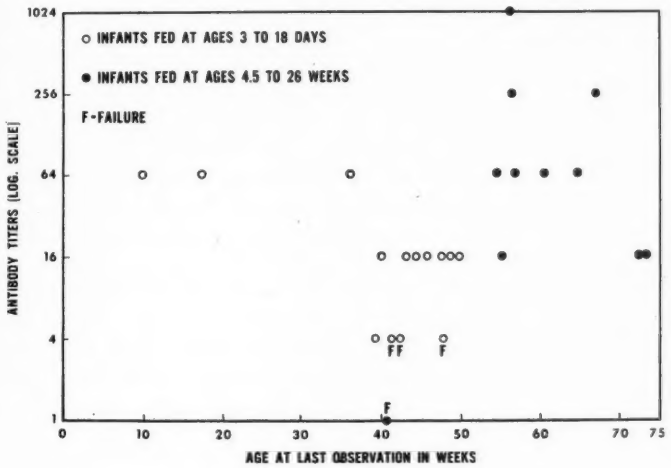


Fig. 2. Antibody response on twenty-five infants fed attenuated Type I poliomyelitis virus (SM strain), Minneapolis, 1957.

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THE capacity of the newly-born infant of man and animals to acquire congenital passive immunity against viruses following injection of the mother during pregnancy with the corresponding antigen, has been satisfactorily demonstrated and reviewed by Anderson et al.[1] Pinto, in 1949,[2] found the progeny of cotton rats highly resistant to challenge inoculation if their mothers were injected during pregnancy with the adapted Lansing strain of poliomyelitis virus. Similarly, Curley and Gordon[3] have proven in mice the transmission of passive protection against the M.M. strain of mouse encephalomyelitis virus from immune mothers to offspring. These authors demonstrated further that challenging the passively protected young mice with fully virulent virus resulted in active lasting immunity which developed during the declining phase of placentally transmitted antibodies.

Poliomyelitis antibodies were first shown to be passively transferred in the human from mother to baby by Aycock and Kramer in 1930.[4] It has

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Presented at the annual meeting of the Minnesota State Medical Association, Minneapolis, May 23, 1958.

been suggested that this placentally transferred passive immunity can be converted to an actively acquired immunity by the occurrence of subclinical infections during the phase of declining protection of maternal antibodies. This mechanism would partially explain the relative absence of poliomyelitis epidemics in most tropical and subtropical countries,[5] an observation however which seems no longer substantiated as socio-economic and hygienic conditions improve in these areas.

TABLE I. GEOMETRIC AVERAGE OF FOLD INCREASE IN ANTIBODY TITERS AFTER TWO INJECTIONS OF SALK VACCINE

	Method of Vaccination					
	Subcutaneous			Intradermal		
	Type I	Type II	Type III	Type I	Type II	Type III
Lot 028849-A	11.2 (24)	9.1 (25)	9.8 (25)	9.1 (25)	13.5 (25)	12.3 (22)
Lot 029126-A	10.7 (20)	20.9 (20)	14.8 (20)	17.4 (16)	18.6 (19)	19.1 (17)
Lot 9184-653802	8.3 (19)	8.4 (23)	10.4 (19)	12.0 (15)	17.0 (21)	24.0 (17)

Those with non-measurable antibody titers excluded—number of observations in each average recorded in parenthesis.

The results being presented here are limited to: (a) a comparison of the antibody response in pregnant women to Salk vaccine administered by subcutaneous and intradermal injection, (b) the measurement of passive transfer of naturally occurring and Salk-vaccine-induced poliomyelitis antibodies from mother to infant and of persistence of these maternal antibodies in the infant, (c) the response of newborn babies and infants under six months of age to infection with the attenuated Type 1 poliomyelitis virus (SM strain).

One hundred and thirty eight pregnant women were selected for vaccination with Salk vaccine. Half of this group received the vaccine intradermally (0.2 ml. twice, three to four weeks apart), the other half subcutaneously (1.0 ml. twice, three to four weeks apart). Three lots of commercially-prepared Salk vaccine from two different manufacturers were used.

Blood samples were collected immediately before the first injection and approximately four weeks after the second. At delivery a third specimen of maternal blood and a sample of cord blood were drawn. Blood samples were collected from the infants at approximately three-month intervals for one year or until no detectable antibody titers remained. Quantitative assay for neutralizing poliomyelitis antibodies in the sera was performed using HeLa cell cultures. Six serial four-fold dilutions of the serum (1:4 to 1:4096) were prepared and four tubes of HeLa cell culture per dilution were used. The end point of titration was determined by microscopic observation of the inhibition of the cytopathogenic effect of the virus.[6]

TABLE II. ANTIBODY RESPONSE AND STOOL ISOLATION RESULTS ON 25 INFANTS FED ATTENUATED TYPE 1 POLIOVIRUS (SM STRAIN) Minneapolis, 1957

Ages at Feeding	Number of Infants	Amount Fed $T.C.D._{50}$	Per Cent With Positive Stools	With Antibody Response at Last Observation		Median Weeks of Observation
				Number	Per Cent	
3-18 days average 8.7	14	4.2-5.0	60.4	11	78.5	43
4.5-26 weeks average 11.9	11	4.2	90.9	10	90.9	49
Total	25	4.2-5.0	76	21	84.7	

To a group of twenty-five infants under the age of six months, born of mothers vaccinated during pregnancy with Salk vaccine, Type I attenuated poliovirus (SM strain) was given orally mixed in nursery formula or regular cow's milk. The presence of virus in the stools and the immune response in each child was followed by serial stool cultures at weekly intervals for five to twelve weeks and by serum antibody determinations at one-month to three-month intervals up to approximately one year.[7]

TABLE III. SERUM ANTIBODY TITERS AT LAST OBSERVATION FOLLOWING PARALYTIC POLIOMYELITIS (VIRUS TYPES 1 AND 3) AND AFTER IMMUNIZATION WITH ATTENUATED TYPE 1 POLIOVIRUS (SM STRAIN) Minneapolis, 1957

Group	Number of Subjects	Time of Last Observation in Weeks (Median)	Serum Titer (Median)
Adult patients with paralytic poliomyelitis	7	51	1:64
Infants fed SM strain at ages 3 to 18 days	11	43	1:16
Infants fed SM strain at ages 4.5 to 26 weeks	10	49	1:64

Results

Intradermal inoculation elicited as good an antibody response as the larger subcutaneous dose in those subjects whose antibody titers were measurable before and after vaccination (Table I). The lots of Salk vaccine used varied in antigenic potency.

Cord blood antibody titers were equal to or within one tube difference (within the error of the method) of maternal titer at delivery in over 85 per cent of the instances where such comparisons could be made.

The "half life" of Types 1, 2, and 3 antibodies present in the neonatal period was approximately five weeks (thirty-seven days) regardless of the level of the cord blood titers. Detectable antibody titers were present at nine months of age in the majority of infants who had an antibody level of 1:1024 or greater at birth. The gradual decline of antibody titers of two infants in our study during the first year of life is depicted in Figure 1.

No significant untoward reactions were observed in the infants fed the attenuated virus. The slight gastrointestinal symptoms occasionally reported were probably no more numerous than they would be during a comparable period with unvaccinated infants, particularly since mothers were warned to be especially observant.

Wiener[8] and Good[9] have reported that normal newborn infants up to approximately three weeks of age are immunologically inert and incapable of producing gamma globulin or responding to a variety of antigenic stimuli with measurable amounts of antibodies. In Table II results of the antibody response and virus isolation in the stools of fourteen infants under three weeks of age (age range three to eighteen days) are compared with similar data from eleven older infants (age range four and five-tenths to twenty-six weeks of age). It appears that a higher percentage of intestinal infections was induced in the older group with smaller doses of virus. Two infants under two weeks of age with titers no higher than expected from passive antibodies were counted as failures. However, they presented evidence of infection (prolongued virus multiplication in the intestine, spread of virus to siblings) and may eventually be considered successfully vaccinated when later blood samples are obtained. Table III summarizes the serum antibody titers of both groups of infants at the time of the last observation (forty-three and forty-nine weeks after feeding) and compares them with the titers of seven adult patients with severe paralytic poliomyelitis about fifty-one weeks from the acute disease. It can be seen that the median titer of the older infants is equal to the titer of the paralytic polio patients at approximately one year after vaccination and acute illness, respectively. Figure 2* shows the distribution of titers, when last observed, of the two groups of infants. The expected titers of passive anti-

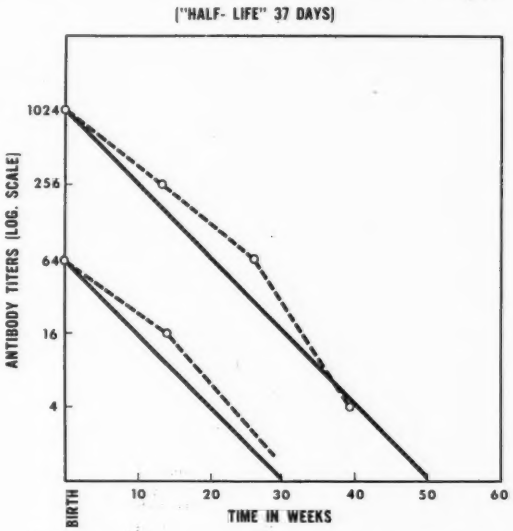


Fig. 1. Rate of decrease of passive poliomyelitis antibody titers in infants ("half-life" thirty-seven days).

bodies of the older group (represented by dark dots), at the time of observation, is below one in all instances and, therefore, the titers obtained represent "active" antibodies and presumably are the result of vaccination. The observed titers in eleven of the younger infants are above expected levels of passive antibody and thus must represent "active" response to the vaccine. However, final titers will have to await later observations.

Figures 3, 4, 5 and 6 exemplify the antibody response of four infants aged six to seven days, after being fed $10^{4.2}$ to $10^{5.0}$ T.C.D.$_{50}$ of Type 1 virus and observed for ten to twelve months. The dotted lines represent the expected exponential drop in passive antibody titer in these infants ("half-life" five weeks). The antibody response of the younger infants seems to level off at a titer of 1:16.

Conclusion

In an immunization program against poliomyelitis with the live poliovirus vaccine it would appear desirable to start vaccination as early in life as possible. If infection with the attenuated poliovirus and the resulting active immunity could be induced during the declining phase of passive anti-

*See page 83.

bodies, uninterrupted protection against the disease would be offered from the moment of birth. The newborn period would logically offer the best opportunity for such a vaccination program since poliomyelitis antibodies are transferred to the baby at the time of delivery. We have observed that the proportion of pregnant women with naturally occurring poliomyelitis antibody titers equal to or

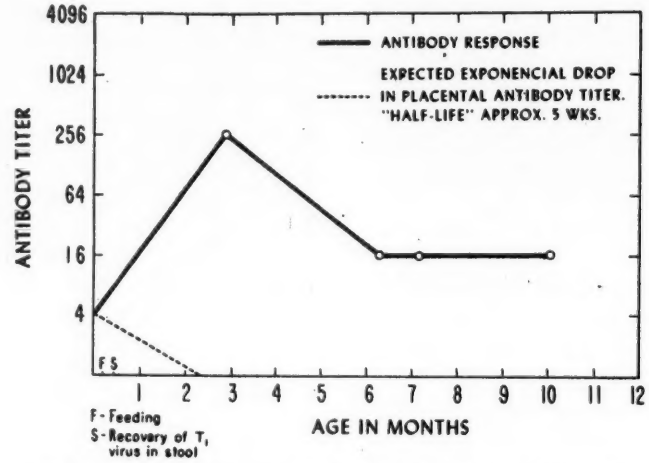


Fig. 3. Antibody response of Baby D.S. after being fed $10^{5.0}$ T.C.D.$_{50}$ of Type I virus (SM strain) on sixth day of life.

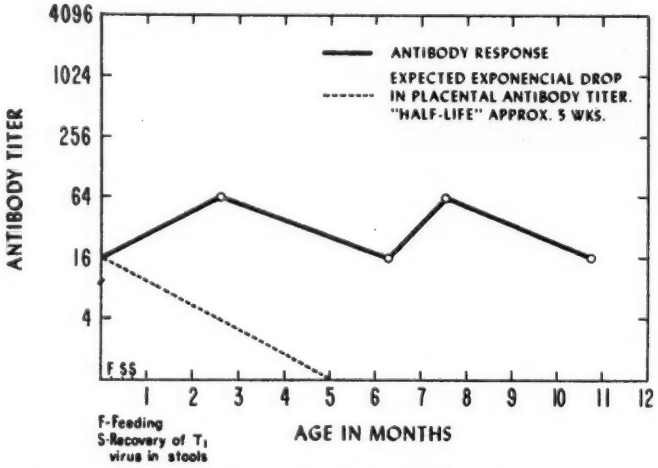


Fig. 4. Antibody response of Baby S.R. after being fed $10^{5.0}$ T.C.D.$_{50}$ of Type I virus (SM strain) on seventh day of life.

it is the first time the baby comes under medical supervision and since almost all births in this country occur in hospitals.

From the observations presented here, it seems that vaccination with the live poliovirus vaccine is possible and adequate in the newborn period although titers obtained are lower than those attained at a later age. With the generalized use of Salk vaccine in pregnant women, high titers of greater than 1:1024 was increased from 10 per cent to about 44 per cent after two injections of Salk vaccine before delivery.[6] The only baby in our series with an extremely high serum titer at birth (1:4096 or higher) failed to respond to the oral vaccine given on the fourth day of life.

Whether or not a larger dose of virus would overcome the difficulty is at present being investigated.

References

1. Anderson, J. A., and Bolin, V.: Congenital antiviral immunity in swiss mice. Am. J. Hyg., 50:200-206 (Sept.) 1949.
2. Pinto, M. R.: Peripheral inoculation of Lansing poliomyelitis virus in rodents: Susceptibility and development of immunity. Am. J. Hyg., 48:361-380, 1948.
3. Curley, F. S., and Gordon, J. E.: Immunization of mice with unmodified M.M. mouse encephalomyelitis virus under passive protection from immune mothers. Am. J. Hyg., 48:81-86, 1948.
4. Aycock, W. L., and Kramer, S. D.: Immunity to poliomyelitis in mothers and newborn as shown by neutralization test. J. Exper. Med., 52:457-464, 1930.
5. Martins da Silva, M., and Syverton, J. T.: Poliomyelitis survey in Rio de Janeiro. Public Health Reports, 71:395, 1956.
6. Martins da Silva, M., Prem, K. A., Johnson, E. A., McKelvey, J. L. and Syverton, J. T.: Response of pregnant women and their infants to poliomyelitis vaccine. J.A.M.A., 168:1-5 (Sept.) 1958.
7. Martins da Silva, M., McKelvey, J. L., Bauer, H., Prem, K. A., Cooney, M. K. and Johnson, E. A.: Studies of orally administered attenuated live virus poliomyelitis vaccine in newborn and infants under six months. Univ. Minnesota M. Bull., 29: 133-150 (Dec.) 1957.
8. Wiener, A. S., Berger, H. and Lenke, S.: Serum gamma globulin in infants. Lab. Digest, 14:11, 1951.
9. Good, R. A.: Morphological Basis of the Immune Response and Hypersensitivity in "Host-Parasite Relationships in Living Cells." Springfield, Ill.: Charles C Thomas, 1957.

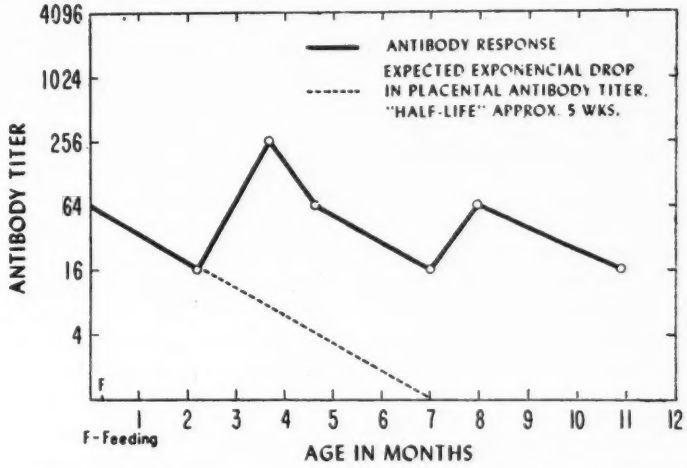


Fig. 5. Antibody response of Baby C.D. after being fed $10^{4.2}$ T.C.D.$_{50}$ of Type I virus (SM strain) on seventh day of life.

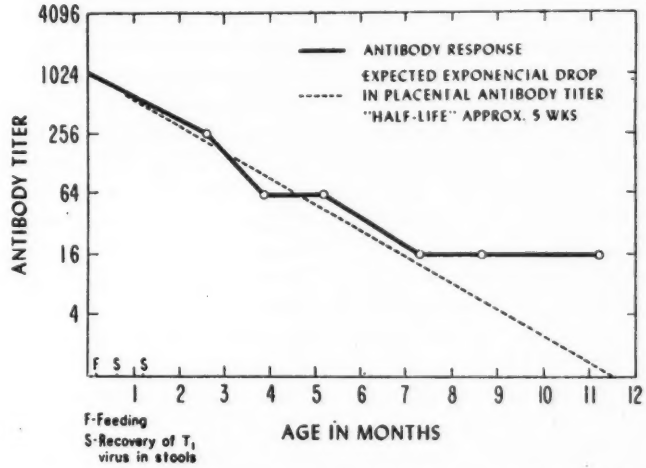


Fig. 6. Antibody response of Baby K.A.K. after being fed $10^{4.2}$ T.C.D.$_{50}$ of Type I virus (SM strain) on the sixth day of life.

Some International Aspects of Virus Diseases

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AMONG the pestilential diseases which inspire dread wherever they occur, the two virus diseases—smallpox and yellow fever—hold high rank. These diseases long have been recognized as serious international problems and international sanitary regulations prescribe the measures to be taken both by infected and receptive countries for the protection of uninfected areas. The current regulations* largely reflect the traditional practice of a previous generation, whose equally important objectives were (a) to prevent the movement of communicable disease from place to place by ship, and (b) to avoid all delays of shipping by quarantine or other restrictive measures. These regulations specifically preclude the application of any measures by health authorities to passengers to prevent the introduction of virus disease other than smallpox and yellow fever.

Yellow fever has not invaded the United States since 1905, yet the federal health authorities have followed with unusual interest the reported movement of yellow fever virus through the forested areas of Panama and four of the five Republics of Central America during the last decade and have been disturbed by rumors of the disease in Mexico in 1957 and 1958. This interest and preoccupation are natural and justified since the last time yellow fever is known to have been in Mexico (1924) a patient with yellow fever died in a hospital in Houston, Texas, having arrived in the United States by boat and passed quarantine at New Orleans. The federal authorities are in a difficult position since they have the responsibility for protecting the United States against the introduction of yellow fever, but do not have the authority to carry out the only measure which would give complete protection against the introduction of yellow fever virus, namely, the eradication of the *Aëdes aegypti* mosquito from our ports and cities.

In 1947, the representatives of the twenty-one American Republics, meeting as the Directing Council of the Pan American Sanitary Organization, recognizing the impossibility of protecting the cities and towns of the Americas from invasions of yellow fever virus from the animal reservoirs in the forests, through traditional notification and vaccination procedures, approved a program for the eradication of the only urban vector, the *Aëdes aegypti* mosquito, from the Hemisphere. To be successful, this effort had to be universal throughout the infested areas. Fortunately, the areas under the control of France, the Netherlands and the United Kingdom have entered wholeheartedly in this hemispheral project. This effort is an important landmark in public health practice; for the first time in history, the nations of a region banded together for the complete solution of a common problem through corrective measures to be taken in each country.

In not protecting itself against the possible introduction of yellow fever virus and in not collaborating with the other nations of the Americas in the permanent solution of this common problem, the United States is shamefully behind the progress registered throughout most of the hemisphere. So long as the United States harbors the *aegypti* mosquito, it will be a potential source of reinfestation of those of our neighbors to the south, who have it no more. The 1958 analysis shows that the continental campaign for the eradication of the urban vector of yellow fever, officially approved in Buenos Aires in 1947, is well advanced; *Aëdes aegypti* is no longer to be found in Bolivia, Brazil, British Honduras, the Canal Zone, Ecuador, French Guiana, Guatemala, Nicaragua, Panama, Paraguay, Peru, Uruguay; the eradication effort is almost complete in Chile, Colombia, Costa Rica, Honduras, and El Salvador; and Ar-

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*International Sanitary Regulations of the World Health Organization (1951).

gentina, Venezuela, Cuba, the Dominican Republic and Haiti have organized national *aegypti* eradication programs. Only the United States and one other republic are absent from these lists. This republic insists it cannot undertake the eradication of *aegypti* until the United States does so, since, given its geographical position, reinfestation would be continuous from the United States.

Although the federal service does not have the authority to eradicate *aegypti* in the cities and ports of this country, it is clear that the individual state, eradicating *aegypti* independently of concomitant action taken by other states, would be subject to reinfestation from neighboring states. The initiative in planning and co-ordinating the eradication of *aegypti* in the United States (to comply with our moral obligation to the other countries of the continent) must be taken by the United States Public Health Service. The rumor that the United States—which spent so many millions to fight foot and mouth disease in Mexico—has hesitated in the case of *aegypti* eradication here, because of the cost of the operation, has caused much merriment among health workers of other countries. They have even suggested among themselves that those countries which have already made the investment necessary to eradicate *aegypti* should contribute to a fund for its eradication in the United States, as a means of protecting their own investment.

So long as quarantine and international sanitary regulations have existed, just so long has it been obvious that the attempt to prevent the movement of smallpox from country to country through mutual notification of outbreaks, compulsory vaccination of international passengers, and quarantine of uncertified passengers, can be only partially successful.

In 1936 a severe outbreak of smallpox was initiated in Uganda by a certified, but unvaccinated ten-months-old child from Bombay, India; and in 1947, a bus passenger from the Mexican border introduced smallpox into New York City in spite of the border quarantine services. In the following years, Mexico has carried out an intensive vaccination campaign and since 1951 has not reported cases anywhere in the Republic. Clearing Mexico as a seedbed of infection has undoubtedly been a primary factor in the absence of reported smallpox in North and Central America and the West Indies since 1954. It has long been obvious that freedom from the threat of smallpox must depend either upon maintaining a high level of immunity in the population through vaccination and revaccination or upon eradicating smallpox from other countries. Experience has shown that it is difficult to maintain a satisfactory degree of immunization, as witness the near panic and the emergency vaccination of many millions of persons in the metropolitan area of New York in 1947.

Since 1950 the countries of the Americas are committed to a program of smallpox eradication. The Pan American Sanitary Organization is co-ordinating the activities in various countries and has been particularly active in developing effective vaccines, of both the classical and desiccated types, for use under varying conditions. This eradication effort in the Americas has been a low-pressure effort, designed not only to eradicate smallpox, but also to make provision for continuing production of vaccine and routine immunization of a certain part of the total population each year. It has been recognized, in effect, that the Americas could not get the full benefit of eradication on a regional basis, so long as the threat of reinfection from other parts of the world persisted.

The Eleventh World Health Assembly, meeting here next week, will consider a draft resolution presented by the USSR, calling for a high-pressure campaign for the world-wide eradication of smallpox by 1962!* Now that the USSR has eliminated smallpox in its own population, it realizes that the costly permanent effort needed to maintain that population immune, would be unnecessary, were all of the countries of the world to get rid of smallpox at the same time.

The programs for the eradication of the urban vector of yellow fever and of smallpox in the Americas, and the proposal to eradicate smallpox on a global basis, are part of a new pattern of communicable disease prevention which is evolving as a result of the development of air transportation, the discovery of efficient insecticides, drugs and antibiotics, the rehabilitation of the eradication concept, and the recognition by the nations of the world of the signal value of international health organizations as agencies through which information can be exchanged, research co-

*The USSR proposal was referred to the Secretariat for study previous to reconsideration by the Twelfth World Health Assembly in 1959.

ordinated, and technical and material resources pooled for planning and executing international and even world-wide programs. Smallpox became technically eradicable with the work of Jenner, but only now has it become administratively so.

The protection of the United States from the introduction of disease agents and participation in the International Health Organizations are federal functions, but the United States Government has very wisely had the State Health Services represented on the U. S. Delegations to the World Health Assemblies and has approved state health officials serving as consultants to WHO all over the world. It is then highly fitting that the State of Minnesota and the City of Minneapolis should be co-hosts with the United States Government in holding the Eleventh World Health Assembly here. It is also highly fitting that a number of delegates to the Assembly from other countries should come to this Annual Meeting of the State Medical Association to hear reports on pioneer work done in Minneapolis under the auspices of the State Board of Health, in testing living attenuated poliomyelitis virus vaccine. As Director of the Pan American Sanitary Bureau, I am pleased that the Bureau has had a small part in this work which, important as it may be for the United States, is much more important for those countries without the technical and financial resources to make full use of the inactivated virus vaccine currently available. From the international point of view, it should be noted that, on the basis of the detailed information on tests in Minneapolis, more extensive field tests of the live virus vaccine were begun very recently by the Ministry of Health of Colombia with the participation of the Bureau.

In spite of the recommendation of the Expert Committee of the World Health Organization last year (1957) that large-scale tests of live virus poliomyelitis vaccine should be made, unaccountable opposition to such tests has arisen in some quarters. While countries, which can and are protecting their susceptible population groups with inactivated virus, may be justified in an overcautious approach to live virus vaccine, recognition should be given to the situation in other countries, where conditions remain much the same as before the introduction of the inactivated vaccine. Listening to opponents of testing live polio virus vaccines, one might infer that the introduction of live yellow fever virus vaccine was a criminal procedure at the time it occurred. The introduction of inactivated (formalin treated) yellow fever virus vaccine was followed by uncertain results and in the light of apparent dangerous infections was abandoned by its proponents. Later, when mouse-brain-adapted virus, incapable of producing visceral yellow fever, but highly neurotropic, became available, French workers tested it as a vaccine and eventually vaccinated many millions of persons with it. The workers at the Rockefeller Foundation considered this neurotropic virus dangerous and continued to test various combinations of viruses and immune serum in the laboratory and in the field. These tests continued for several years with less than satisfactory results until nonviscerotropic virus with greatly reduced neurotropism became available late in 1936. This virus, known as 17-D, is the source of all vaccine produced in the Americas and most of that in Europe during the past twenty years.

When Virus 17-D became available to workers in Brazil, tests with it had been limited to a series of monkeys and a small number of persons in New York, yellow fever was active in the State of Minas Gerais and a decision had to be taken as to the propriety of its field use before more extensive laboratory testing. The decision was in favor of its immediate use and, after a cautious beginning, some 40,000 people were vaccinated in 1937 without any untoward incident. The following year, 1938, in the face of a major outbreak of jungle yellow fever, slightly over one million persons were vaccinated, again without incident. In spite of this initial success during two seasons, difficulties were encountered in the following years: first, loss of antigenicity of the substrain of virus used for vaccine production; then, serum hepatitis; and finally, post-vaccination encephalitis. These problems were solved, one by one, and during the past sixteen years no difficulties have been encountered in vaccinating millions of persons with the Virus 17-D vaccine, produced in Brazil. Looking back on the experience with the yellow fever vaccine, it seems unlikely that any of the difficulties met would have been found and eliminated by even a prolonged series of small scale tests.

The WHO Expert Committee's 1957 recommendation of large-scale, live poliomyelitis virus tests is believed to be sound. The field demonstration already begun in a rural county in Colom-

bia, as a follow-up on the Minneapolis tests, should lead without interruption, in the absence of obvious contraindications, to an ever-expanding application throughout this South American Republic. And just as the Minneapolis experience is of value to other countries, so will the Colombian experience be important to Minnesota and to the United States. It would have been difficult to carry out the initial tests in Colombia, and impossible to carry out the large-scale tests projected for Colombia in the U. S. since we have no large populations in areas uninfluenced by the heavy use of inactivated virus vaccine.

Poliomyelitis is, of course, one of the most universal viruses known; it is so widespread that health authorities have despaired of measures to prevent its movement from place to place. The fact that the course of certain especially paralytic outbreaks, which have been studied epidemiologically, can best be explained on the hypothesis of the introduction of a specially neurotropic and rapidly spreading virus at a certain place from which it later spread to other areas, has caused some authorities to consider travel restrictions for at least the more susceptible age groups coming from epidemic areas. Such restrictions were temporarily enforced by various American nations and by at least one country of Europe during the severe outbreak in Argentina in 1956. It is to be hoped that the present studies will result in the development and acceptance of a polio vaccine which will be so cheap and so easy to give that its use can become world-wide for the protection of the 80,000,000 babies born each year into this heavily infected world, before other international complications develop.

Time does not permit mention of the international aspects of influenza and the part international co-operation played in the dramatic experiences of 1957 with the Asian strain. Nor of the importance of rabies, psittacosis, and foot and mouth disease as international problems.

No discussion of the international aspects of virus diseases can ignore the rapidly increasing number and variety of viruses, particularly of the *arbor* and *echo* groups, capable of infecting man, some of widespread, others of very limited distribution, which constitute a whole series of potential international problems. The listing of the names of some of these viruses, generally derived from the place of discovery, is enough to emphasize the international character of these problems; St. Louis, Colorado, California bat, Russian Spring and Summer, Japanese B, Murray Valley, Rift Valley, Belém (Brazil) Ilheos, Mayaro, Sindbis, Semliki Forest, Kyanasur Forest, Bwamba, Bunyamwera, Trinidad, Venezuela EE, Western EE, Eastern EE, Tongaland, Uganda, West Nile, Zika, Chikunguya and Nyaya!

For the uninitiated, it should be stated that *arbor* viruses are not necessarily found in trees but are Arthropod-Borne; and that *echo* viruses are not imitatively repetitious, but are Enteric-Cytopathogenic viruses of Human origin which were at one time thought to be Orphaned, that is lacking any parent disease to which they were related. That this Orphaned condition is not universal for the group is shown by Minnesota's widespread epidemic of *Echo 9* infections in 1957.

As observations continue, conscientious health officers are going to be faced with innumerable questions, to which some answer must be given, such as the following:

What is the potential international threat of the highly fatal hemorrhagic disease, occurring in certain capitals of Asia (Manila and Bangkok), the virus of which has been isolated from *Aëdes aegypti,* the common household mosquito vector of yellow fever? And what is the importance to other countries of Asia and to the forested tropical regions of America and Africa of the Kyanasur Forest Virus of the Russian Spring and Summer Encephalitis group highly fatal to monkeys and to man, transmitted by mites? Should these diseases of Asia be made the object of international sanitary regulations as are *aegypti* transmitted and jungle yellow fevers which they so closely resemble? And are the virus diseases of Asia transmitted by the *aegypti* mosquito of sufficient importance to justify the expense of eradicating this mosquito from that region as is being done in the Americas?

The answers to these and similar questions must await further study and observation, in many different countries; they can not be based on the action of individual countries attempting to protect only their own populations. Regional and global solutions must be sought and in the seeking, the nations of the world can best proceed by using their official health agencies—the Pan American and World Health Organizations—to co-ordinate research, exchange information and co-operate in attacking individual virus problems wherever they may be.

• *Numerous progressive and fascinating studies of psychiatric concepts and methods of therapy have been taking place in the Netherlands. Some undertakings have been on a limited scale, others quite extensive. The program of "out-call" psychiatric consultation as the method of initial evaluation and the monetary rewards for constructive work completed by in-patients are two of the most practical channels of meeting mushrooming needs for psychiatric care. The author's remarks are particularly authoritative because he was trained in the Netherlands and has practiced psychiatry in the United States.*

Some Aspects of Psychiatry in the Netherlands

Their Potential Applications in the United States

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EN ROUTE to Zürich, Switzerland, to attend the second International Congress for Psychiatry, I spent several days visiting various psychiatric hospitals and clinics in the Netherlands. Some of the things I observed there were entirely new to me; others were essentially unchanged from the years I had studied at the University of Amsterdam Medical School. Yet, regarding the latter, much seemed to be different because I evaluated them from a different point of view, that of one grown accustomed to the practice of psychiatry in American state hospitals. The Congress at Zürich brought out some of the differences and many of the similarities between modern American and continental European psychiatry in general (Great Britain's psychiatric practice lies somewhere in between since it possesses features of both). My observations in the Netherlands note the similarities and differences in regard to some particular aspects of psychiatric practice and research.

Some of these observations have been reported in the American literature in recent years,[1,2] although never in sufficient detail to convey their full impact to American psychiatrists. It is the purpose of this paper to give a better understanding of Dutch psychiatry by describing some of its aspects, as follows:

1. The system of domiciliary care or psychiatric first-aid developed by Professor A. Querido and in effect since the mid-thirties.[3,4] If suitably adapted and modified to meet different conditions in the United States, this system may offer a practical solution to the problem of a steadily increasing hospital population.

2. A unique research study for the treatment of mentally disturbed criminals—mostly psychopaths who have not responded to more conventional psychiatric treatment methods. The observations and ultimate results of this group of researchers, headed by Professor Dr. P. A. H. Bann,[5] may be expected to have considerable bearing on the future disposition and handling of delinquent psychopaths in this country.

3. The use of work therapy in mental hospitals, as observed at the mental hospital at Santpoort under its medical superintendent, Dr. W. Ploegsma.[6-8] This hospital serves as an outstanding example of the usefulness of a well-formulated and organized application of the principle of meaningful work and monetary compensation to patient-workers.

4. A novel, if not revolutionary, theory of the origin and treatment of neuroses developed by Dr. A. A. A. Terruwe. This theory provides an acceptable and intellectually satisfying explanation of Freud's basic discovery, the repression. This thought-provoking study with its far-reaching therapeutic implications will be introduced to American psychiatry in the near future when P. J. Kenedy & Sons, New York, publishes the Eng-

lish translations of two books by this author, "Psychopathic Personality and Neurosis" and "The Neurosis in the Light of Rational Phychology." For this reason, as well as for that of space limitation, a discussion of this most important topic will be omitted in this paper.

Domiciliary care, an experiment in mental health.—This system was gradually developed in the city of Amsterdam after the first World War as part of a new program of social reform which included the reorganization and extension of the city's public health department. It is based on the theory that the cure or the rehabilitation of the mentally disturbed person can be accomplished only in society itself, and that a successful stay in society is the only real test of any therapeutic endeavor. This implies that the removal of a mentally ill person from his social background must be considered as an illogical procedure unless indicated for strictly medical reasons.

One of the most important features of this psychiatric first-aid "on-the-spot" service is the opportunity for the psychiatrist to study the conflict in its proper setting. When the psychiatrist and his social worker are called out, they are able to observe and evaluate first-hand the interplay of all factors related to the mental conflict. Without any special effort, the total socio-economic picture, i.e., quality of surroundings, attitude of spouse, parents, siblings or children, the tensions caused by poor living conditions and poverty, lies before them. They can see how the patient is feared, loved, respected or rejected. They see the reactions of the neighbors and the attitude of the patient toward authority. They see signs of hobbies, of interest in social or cultural activity. They get an inkling of the burden of material care that rests on the family.

With all this information readily at hand the expert psychiatrist is able to decide immediately whether rehabilitation of the patient in his own surroundings is feasible, or whether for medical reasons hospital stay is necessary. If the former decision is possible he will find that the attempt to re-establish the disturbed equilibrium is usually of shorter duration, cheaper, more efficient, and more directly concerned with the fundamental conflict, therefore offering more chance of success.

For a better understanding of this unique mental health service which obviously provides social rather than medical treatment in the strict sense of the word, it is helpful to take a closer look at the manner in which the system operates in Amsterdam. This city of approximately 900,000 is rather compactly built, the farthest distance across being not more than six miles. There are twenty-two out-patient treatment centers or "poliklinieken" at which the ambulatory patient can receive specialized therapy provided by his group health insurance program. Each of these twenty-two centers has one psychiatrist among its medical specialists. There are two treatment centers for psychotherapy operating with public grants. The number of psychiatrists in private practice is approximately seventy-five, and the two general hospitals which admit psychiatric patients have together about 300 beds in addition to large out-patient departments.

The mental health service consists usually of twelve psychiatrists, always four or five psychiatrists in training and about twenty-five social workers. Two psychiatrists and two social workers are assigned to each of the six sectors in which the city has been divided. They work on a rotating twenty-four-hour schedule. At night, from the hours of 6:00 p.m. until 8:00 a.m., and on weekends, there is one psychiatrist on duty all the time. There are, on an average, about 3000 adults under supervision, most of whom are living in their own homes and some of them in foster homes. The service receives an average of 250 inquiries daily. Some of these can be dealt with by telephone through quick reference to case records. Others require a home visit by the psychiatrist and his social worker assistant for more detailed investigation.

When an official of the police, social welfare, or any other agency or private party calls the center to report a person who is considered mentally ill, and when this person is not yet known to the service, the psychiatrist on duty is bound to go out and investigate. He is not allowed to deal with such a case by telephone. In the middle of the night this may be a very heavy duty. It may take two or three hours, talking with the patient and the family. Yet it is the only way in which the psychiatrist can get the total picture promptly. On the other hand, his task may be finished in ten or fifteen minutes by a decision that this is a patient for the hospital.

It is absolutely necessary that the first "on-the-spot" contact with the patient is made by a psychiatrist because the responsibility for the decision and the authority required to back this decision, often under emotionally charged and difficult cir-

cumstances, can only be assumed by the expert physician. Although the psychiatric social worker will be valuable in carrying out the necessary case-work and further investigations, he cannot replace the psychiatrist. Experience has taught that such a service with too many social workers relative to the number of psychiatrists lowers its effectiveness to the point of becoming utterly useless. To the often-heard objection that there could not be enough psychiatrists to carry out this kind of work, the only answer is that one psychiatrist in this service has been found to be more effective than all the personnel of a fifty-bed ward.

Another important aspect of this service is its educational impact on the patient who must be educated to accept society, as well as on society and its representatives who must be educated to accept the patient. Every time the service comes into action, it teaches by example how to deal with the mentally ill patient. Usually the first emotion felt by the uninitiated bystander on seeing a mentally disturbed person is one of fear. Often he feels an urge to overpower that person in order to make him harmless. When a psychiatrist, properly trained for this work, enters upon the scene, he demonstrates by his own behavior that a certain situation can be changed by a certain attitude; that by treating the patient with understanding and honesty, *especially honesty*, and without showing fear or using force, it may be possible to reduce existing tensions in such a manner that they can be dealt with. The ubiquitous sensation-seekers soon disappear shame-facedly. Instead of seeing a screaming bundle of misery dragged to the ambulance or struggling between two policemen, they watch the patient calmly accompanying the doctor to the hospital or left at home when things have been smoothed over for the moment. It is obvious that such an occurrence cannot fail to leave a deep impression on those who witness it and is apt to change the layman's concept regarding mental illness more than any lectures or newspaper articles.

Asked about the problems involved in setting up a similar service elsewhere, Professor Querido emphasized that it should be started on a small scale and be allowed to grow gradually by itself. Although the need for such a service will usually be most pressing in the larger cities, it could be equally well established in rural communities. Because of the fact that the service must be ready to meet every personal emergency at any time, there must be no delay or bureaucratic machinery between the moment a problem comes to the attention of the service and the time when the first contact is made by the psychiatrist. Much will depend here on the relations between public authorities and various agencies already in existence. The personnel in this service must show a warm understanding of human needs and a matter-of-fact equanimity toward any of the multitude of incredible situations which may occur at any time.

It is immaterial whether such a service be set up by state, county, city or private bodies or organizations. All of them are possible and equally feasible. It may be run by one hospital alone, or by a group of hospitals; or private organizations and voluntary societies may unite to set up such a service. In the beginning it would be advisable for the service to limit itself to one or two groups of patients such as those suffering from alcoholism, suicidal tendencies, drug addiction, or the disturbed geriatric patient. The speed with which the service should be allowed to develop itself will depend on its initial success with these patients, the cooperation the service will obtain from other organizations, and the time it takes to overcome the opposition from the patients' families, hospital administrators, psychiatrists in private practice, and others.

Although it is naturally impossible to estimate the total number of hospital beds that have been saved by this service, or the number of hospitals that did not have to be built, or any of the other savings that have been made possible, the over-all success of this domiciliary system in Amsterdam (as well as in other Dutch cities and communities during the approximately thirty years of its existence) has been such that its principle warrants close study and investigation for eventual applicability in various American communities.

Investigation of treatment methods of mentally disturbed criminals.—A unique research program in forensic psychiatry has been in progress since April 23, 1955, at the Dr. van der Hoeven Clinic in Utrecht. On that day the clinic opened its doors to the first group of twenty mentally disturbed delinquents of all types, mostly psychopaths who had not responded to previous attempts at therapy and rehabilitation. In August, 1957, when I had an opportunity to visit the clinic and to learn about its operation from the clinical director, Dr. A. M. Roosenburg, and the socialogist, Dr. J. L. Jessen, the population of the clinic was close to

its maximum of 100 patients. Prompted by the steadily increasing cost of crime prevention and control and the urgent need of a more effective rehabilitation of mentally disturbed criminals, the idea for this particular clinic was based upon the hypothesis that behind the mask of the psychopath is hidden a deeply disturbed neurotic personality which is treatable by as yet unknown psychiatric methods. Thus, the clinic's goal is a form of neurosis center where psychopathic delinquents can be casually treated.

The very close relationship between the staff of the clinic and the patients who are organized in a patient government reminds one of the therapeutic community of Maxwell Jones' Belmont Hospital in England. The important difference, however, is that at the latter only neurotics are treated, while most disturbed criminals and some other types of mentally ill are not admitted. At the Dutch clinic only mentally disturbed criminals are admitted and studied. The importance of this difference is well demonstrated by the fact that the application at the Dutch clinic of Jones' principle of maximum freedom and minimum control proved to be a serious failure with dangerous complications. It had to be replaced soon by a so-called "controlled milieu" with a clear separation of the therapeutic activities and the administrative aspects of the controlled milieu.

In this in-patient clinic, emphasis is placed on individual and group therapy, as well as on training for work and industry. All patients belong to one or more therapeutic social groups, and group therapy sessions are held two or three times a week. There are daily staff meetings, and once weekly all patients meet with the professional staff consisting of four psychiatrists, four psychologists, six to eight social workers, one sociologist, two chaplains and one registered nurse, plus the administrative staff.

The development of attitudes, operative procedures, and therapeutic methods has been most difficult in the first year of this clinic's existence and it is expected to take at least another two or three years before the "children's diseases" inherent in such a novel experiment will have been overcome. It already has become clear that the therapy of these so-called "incurable psychopaths" brings along real dangers. For instance, in spite of many warnings and explanations, some of the less experienced social workers and nursing personnel got emotionally involved with some of the patients, which at times led to grave complications. Some of the seemingly normal patients were even able to deceive members of the staff and to involve them in erotic relationships which led to unpleasant consequences for the parties concerned. Some of these patients had, as a result, to be transferred to another institution, while others developed such tensions that they sought relief in escape.

Most important from the viewpoint of research were the consequences in those persons whose "mask of sanity" was being lifted by the process of therapy. Three distinct types of complicating reactions were observed. First, psychosomatic complications, *e.g.*, the reactivation of subclinical infections such as lung and kidney tuberculosis, aggravation of stomach ulcers and other similar conditions; second, panic reactions, personality disintegration and even psychotic reactions; and third, aggressive or escape reactions resulting in either physical aggression or actual escape from the unbearable situation. All these developments have stressed the need for the personnel to have a sufficient insight into their own emotional difficulties, to continuously exchange ideas and opinions with more experienced staff members, and also to observe and analyze constantly the manifold events occurring in this therapeutic community.

Obviously, merely a beginning has been made and much remains to be done in the development of psychotherapeutic and other treatment methods of those persons designated as criminal psychopaths. The problems to be solved are numerous. The magnitude of the problem of the criminal psychopath demands that the rest of the world follow closely the results of this courageous group of investigators under the leadership of Prof. Dr. P. A. H. Baan.

Work therapy in mental hospitals.—This form of therapy in the Netherlands deserves special mention because it differs in some important aspects from the system of work assignments prevailing in most American institutions. This particular system of work therapy was first introduced in the Netherlands at the Santpoort Hospital in 1926 by Dr. W. M. van der Scheer, its medical superintendent. He followed the method of Dr. H. Simon, medical superintendent of the German institution at Gütersloh. In many respects it must be considered the backbone of all forms of psychiatric treatment in the Dutch institutions, just as an occupation or profession may be considered the

backbone of an individual's adjustment in normal daily life.

Although in most Dutch, English, and American hospitals many of the less handicapped patients had been engaged in work activities for years, it was not until later that the experiences at Gütersloh revealed that work therapy could be practiced by all patients, even the most disturbed ones, provided that there is constant supervision and help from trained personnel which has to engage in the same type of work as the patient themselves. Moreover, the work itself has to be useful and must never be devised merely to keep the patient busy. In giving the patient a meaningful work assignment, his total condition has to be considered; and although it is necessary for him to work on a level within his capabilities, it must take some effort for him to accomplish the work. Usually the patient has to start with a simple form of activity and progress gradually to more difficult work. To change the patient's work assignments at the appropriate time, it is necessary that his accomplishments and his behavior are observed closely. For, if the patient is made to work above his level of ability, it will increase his resistance against reality and make him seek refuge in his psychotic experiences. If, on the other hand, he works below his level, it will be too easy for him and he will do his work automatically, giving him the opportunity to wander off into his pathologic dream life.

To provide this close supervision, it is necessary that patients work in groups which are not larger than approximately fifteen patients. The group may be directed by a nurse or psychiatric aide, an occupationally trained employee such as a gardener, electrician, baker, or even by another patient who naturally must be more nearly well and capable than the patients in his group. It is furthermore necessary that the medical staff receive regular reports about the achievements, behavior and attitude of each patient engaged in work therapy. This is usually done through weekly reports. The institution must have a rich variety of work activities at its disposal in order to provide each patient with a suitable work assignment which takes into consideration his background, experience, interests and present mental condition.

It is advisable for the group leaders to be trained in the work that the patients in their group perform in order to be able to give them the maximum assistance. Many of the Dutch hospitals provide special programs for psychiatric aides, registered nurses and student nurses to be trained as work therapists. Santpoort, for instance, offers the student nurses courses in handicrafts, sewing, darning, crocheting and knitting. All personnel at this hospital are required to get at least one year of actual work experience in one or more of the crafts or work assignments employed at the hospital, be it with the lawn crew, tailor shop, toy repair shop or other work shops. It is also advisable, though not absolutely necessary, that adequate work space be provided. Such was done recently at the Santpoort hospital when a new work therapy building was erected with separate rooms for wood work, shoe repair, book bindery, tailor shop, paint shop, toy making and toy repair shop, and various rooms for making brushes and sweepers, rushing baskets and bottoming chairs, mat making, weaving, knitting and crocheting. The principle that all work has to serve some useful purpose—that is, it must never be designed for the sole purpose of keeping the patient busy!—is adhered to rigidly at all levels, even the work of the most deteriorated patient. So, for instance, the simplest type of little productive craft work which I observed was fluffing rope; several groups of chronic schizophrenic patients were occupied with this work, the end product of which is used to fill, together with tar, the cracks in ship hulls.

All actively engaged patients receive a weekly monetary reward up to a maximum of 2½ guilders. The size of this reward, which is not a salary, is determined by the psychiatrist in charge of the patient. He relies on his own observations and the reports he receives from the group supervisors about the patient's achievements and demonstrated interest, as well as his social behavior in the group. The patient gets paid in regular currency if he is able to handle it. If this is doubtful, he gets tokens which he can use just like currency in the hospital shop—or throw it into the water if he is inclined that way. The patient is free to spend the money earned in whatever way he pleases. At the same time it presents him with an opportunity to learn to save and thus to postpone his urge to spend. However, he is never forced to save.

This system of monetary reward for work well done has been proven to be of great importance in the over-all therapeutic program of the patient. The following pedagogical principles of such a system are easily detected: (1) The recognition of the value of the patient's work, (2) The recog-

nition of his good behavior, (3) The opportunity to teach him that good behavior is at least as important as his work achievement, (4) The learning to handle money or tokens by spending wisely and usefully or by saving so that later he may purchase larger and more expensive articles such as shoes, suits, books, and so forth.

The finished products of the patient's handiwork are sold in the attractive hospital shop, but not outside of the hospital. Their price is comparable to prevailing retail prices in the community, and "dumping" never occurs. These articles are always in great demand, for naturally each piece has been given much individual attention and is of excellent quality. All money from sales in the hospital shop is used for the purchase of new supplies of raw materials, as well as for the rewards distributed each week to the patient-workers. Deficits in this "work therapy fund" are supplemented by yearly or biennial appropriations. It is worthy of note that legislators in the Netherlands have never been stingy with their appropriations to this fund, that Dutch manufacturers and retailers have never objected to the sale of articles produced by the patients, and that Dutch farmers have never considered the hospital-run farms as unfair competition. Such potentially short-sighted views never developed in the Netherlands, because members both of public and private industry, learned early that the long-term savings inherent in this form of work therapy would be much greater in terms of shortened hospital stays than any small savings which could be realized by other systems of work assignments, or lack of a system.

For a better appreciation of this Dutch system of work therapy it is well to digress for a moment and to analyze the system of combined industrial and occupational therapy as known in most American state hospitals. In America the patients are expected and urged to engage in some type of work for two main reasons: (1) because "it is good for the patient" and because "he must be occupied," and, (2) because the hospital cannot be run without his help.

A sick person who is disturbed in his relationship to himself, to society or to both, will find it difficult to understand why it is so good for him to work. Usually he became ill in spite of a lifetime of work, and he fails to see why working should contribute to his recovery.

Asking him to work for the good of the hospital is tantamount to calling upon his sense of duty and obligation toward the common good. If he does not respond to this motive, it is usually because he is too sick to be concerned with the welfare of others; yet his refusal will cause him to experience feelings of guilt and shame. If he does accept the invitation to work, it is often because this work offers him an opportunity to expiate his feelings of guilt or to counteract feelings of worthlessness. This is an excellent indication for prescribing work therapy in many patients, but sooner or later, these patients, too, realize that by working in the hospital industries they are paying off a debt to the state which is giving him something for nothing, or at least for less than cost, namely, psychiatric treatment in addition to room and board. The ensuing psychologic reaction is obvious: deepened feelings of inferiority for having to accept charity.

But by giving him a chance to work for a monetary reward—the closest one can get in similarity to the salary earned for work done in society—one obviates the harmful psychologic effect associated with being left no alternative but to accept charity. Now the patient works for money with which he can buy his own cigarettes, candy or soap; he can write as many letters as he wants, since he is not limited by the hospital's gift of one stamp per week. He has tangible proof that his work is valuable, that he is not made to do things just to be kept busy or out of trouble and mischief. He gains pride and self-confidence when he sees that he is able to produce something useful and wanted by others, for the product of his hands is offered for sale in the hospital shop and sold sooner or later. When the patient has been assigned to a hospital industry, such as the laundry or the bakery, he may not know that this is the best place for him from a psychiatric point of view, but he will know that his work is as valuable as that of the patient in the toy shop, because he can earn as much as the other. He is not made to feel that he owes it to the state to work—if so, why should it pay him a reward?—although this may be hinted at if indicated for therapeutic reasons, for example, in guiltridden, self-accusatory depressed patients.

Later, when the patient begins to realize that he actually produces much more than the value of the reward, it means also that he is well enough to appreciate values and to foster higher qualities in himself, such as a sense of obligation ("the money from the sale of my handiwork helps to

buy raw material for other patients") or gratitude to the hospital staff for taking care of him ("by working in the garden or the machine shop I help them to operate the hospital").

It should be mentioned that in some Dutch mental hospitals, industrial concerns provide orders for various types of work, such as assembly work, sorting and brush making. This work is performed for a fixed price, but the time needed to accomplish it and its total amount is determined by the medical staff. Work for outside industries is an exception at Santpoort because it is felt that the hospital becomes too dependent on the industrial organization. Moreover, little of this type of industrial work is suited for work therapy because mechanical routine jobs are indicated therapeutically in only a small number of cases. And finally, in too many forms of industrial work, there is not enough opportunity for inventive creativeness on the part of both patients and supervisory personnel.

Undoubtedly much of the therapeutic value of the Dutch system of work therapy lies in the fact that the patient gets considerable individual attention. The empty dormitory wards in the Dutch mental hospital are a striking sight to the person who visits during the morning or afternoon hours. So are the many busy groups of patients engaged in different activities, the variety of which is not only stimulating to the patients themselves, but also to the supervisory and actively participating personnel. These sights are in striking contrast to the still too familiar sight of wards in some American hospitals where patients hang around in idle boredom, while the ward personnel does not appear to know what to do with its time. The visitor schedules are also geared to the importance of this superbly organized system of work therapy, the visitors being encouraged to come only in the early evening hours, or being limited to visits on one or two afternoons a week.

Limits of space preclude mention of those aspects of work therapy which are similar to those existing in this country, such as the giving of other rewards, more liberty and responsibility, independent work assignments on responsible posts, nor the many other therapeutic activities, including the physical "movement therapy," which are smoothly integrated with the highly perfected system of work therapy. (In 1956, 87 per cent of the total Santpoort hospital population participated, while in 1955, the total value of articles produced and income for services rendered amounted to almost 54,000 guilders.)

Finally, an over-all comparison between Dutch and American mental hospitals may be of some value. The medical staffs of the Dutch hospitals, though small in absolute numbers, were found to be of the highest caliber, since all members have been fully trained in psychiatry after completion of their medical education. Many hospitals employ physicians who as part of their psychiatric training have to spend six to twelve months in a mental hospital. Other medical specialists are employed also, although in reduced numbers; for instance, Santpoort has, in addition to six qualified psychiatrists and neurologists, one specialist in internal medicine, one in pathologic anatomy, one psychologist, one biochemist and one electroencephalographist. Prestige as well as professional standing were found to be high, both in the eyes of their medical colleagues and in the eyes of the public. Undoubtedly much of this prestige is due to the fact that, contrary to the custom prevailing in many of our state hospitals, the Dutch hospitals will not employ physicians retired from private practice or those with limited or suspended license to practice medicine because of alcoholism, drug addiction, unethical behavior, personality problems, or other reasons. Although the purpose of the employment of such physicians with personality difficulties, namely, the rehabilitation of these physicians, is laudable in itself, such employment has, in my opinion contributed significantly to the inferior standing and lack of prestige which the state hospital physician has in the eyes of his colleagues in this country. Besides, such rehabilitation could be carried out much better and under much more intensive supervision at university rather than at state mental hospitals.

Unlike prevailing conditions in our civil service system, no physicians in the Dutch mental hospitals are called psychiatrists unless they have completed their specialty training. Our practice in this country of providing a non-trained physician with the title of psychiatrist after only one year of work in a state hospital has done much to give the false impression to the public and the legislative bodies that our state hospitals have an abundance of psychiatric specialists.

Salaries of psychiatrists in Dutch mental hospitals were found to be comparable to ours: that is, too low as compared to incomes in private practice. However, these low incomes are largely

compensated for by much higher professional standards in these hospitals, greater opportunities for research and for application of highly specialized psychiatric treatment methods. Often this is not the case in America where the non-qualified physicians, as well as their colleagues with limited license, pull down the level of scientific achievement. This superior professional standing in the Dutch mental hospital was well reflected at the Santpoort hospital in the thorough evaluation of the newer tranquilizing drugs, emphasizing quality rather than quantity. These drugs have been, and are, investigated only in comparatively small numbers of patients; yet, the psychiatrist follows and studies each patient in a more intensive and thorough manner than is possible when one employs an extraordinarily large group of patients. Complete reports of drug effects are made for each patient under investigation, and these are gathered together by the medical director and put in print for the purpose of reference and study rather than of publication. Consequently, the conclusions of these investigations bear much more weight than the mass investigations customary elsewhere, for such mass investigations necessarily lack the thorough study of factors other than the drugs themselves which may also have a bearing upon the patient's response to the drugs.

Reflecting on the merits of the Dutch system of work therapy, it occurred to me that if this system had been developed in the United States, the Dutch and other Europeans would undoubtedly have considered this as another typical example of the power of the American dollar. Most likely they would not have given it another thought. The fact that the reverse took place should make us pause and ask ourselves how this system might enrich the particular therapeutic programs in our state hospitals.

My Dutch colleagues expressed, not unexpectedly, surprise at the glaring discrepancy existing in this prosperous country between the magnitude of the problem of mental illness and the relatively slight financial efforts to cope with it. Only a historic review of the growth of American mental hospitals with their emphasis on custodial care rather than treatment, and an explanation of the particular place these hospitals take in American culture and political structure made these physicians see why it had not been until after World War II that an outraged public had demanded a major overhaul of the "snake pits," and Federal and state agencies had begun to see the need for greater financial support. They found it hard to believe that many a dedicated medical superintendent had fought for this in vain for decades, frustrated as he had been in all his efforts by indifferent politicians. They came to realize that it would take many years of steadily increasing appropriations, as well as a basic change in mental hospital administration, before an adequate number of trained psychiatrists would be attracted to state hospital employment in order to treat patients, to conduct research and to train other personnel.

At the same time, these Dutch psychiatrists came to realize and appreciate the tremendous importance of conditions they had come to accept as a matter of course in their own countries. These are: freedom of interference by political parties or incompetent persons in the administration of mental hospitals, and a balanced value system of giving priority to medical, nursing and other personnel rather than to provisions for better-than-average food and clothing, and thus a correct emphasis on psychiatric treatment rather than on physical comfort.

In this regard I hopefully predicted to my colleagues in the Netherlands that the next several decades in America would witness a tremendous progress as several state governments had already begun to make a concentrated effort to effect a shift from custodial care to active psychiatric treatment, while in the past several years Congressional appropriations had been increased yearly to meet the problem on a national basis.

Yet, from what I observed in the Netherlands it is obvious that money alone will never fully accomplish this tremendous task. Moral, social, scientific and spiritual forces will have to lend a helping hand. Fortunately for the future of our mentally ill sincere, unselfish, competent, and non-partisan persons in some states have already begun to realize this and are meeting the challenge of more intensive psychiatric treatment by studying and suggesting changes in commitment laws, in appropriation procedures, in civil service regulations, by proposing reduction of political control in favor of medical administration of state hospitals, and by freeing medical staffs from unnecessary encumbrance and restrictions.

(References are on page 131)

Blue Shie Its

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• Here is a summary of the history and principles of the Minnesota Blue Shield from its beginning to the present written by a physician who was, and is, active in the total planning.

THERE is so much misinformation and lack of information about Blue Shield that a few words might not be amiss. The basic principles are so simple and straightforward that when they are known, usually they are easily accepted and enthusiastically supported.

The Minnesota Medical Service, Inc., began operation in November 1947. Before that date, however, there is quite a history which has a bearing on subsequent history and progress.

In 1944 we had a rather socialistically-inclined government. In fact the Federal Bureau of Investigation was busily engaged in investigating medical societies here and elsewhere. Earlier in Washington, D. C., such organizations had been accused of violating the Sherman Anti-Trust Law and had been found guilty. They were even classed as a business and not as a profession! So, when Dr. Richard Crammer in Minneapolis and I in Saint Paul conceived the idea of a medical service plan patterned after the Blue Cross, we had these previously-mentioned conditions in mind. We started at the same time, unknown to each other.

My idea was to start in Ramsey County and spread from there, as the Blue Cross had done. So I investigated and, in fact, on February 23, 1942 was given an evening by the Ramsey County Medical Society to present two out-of-town men—Mr. Mac F. Cahal, then of Chicago, and Dr. Jason Hannah of Toronto—to talk to us about their experiences and to give us the benefit of their advice. The subject of the evening was entitled "Pre-payment Plan for Medical Care." The Ramsey County Medical Society was so interested they authorized $500 for further research. We were soon ready to go ahead.

In the meantime at the annual meeting of the Minnesota State Medical Association in Rochester, Dr. Crammer introduced a resolution in the House of Delegates for a Service Plan and it was passed *unanimously.* We in Ramsey County were asked to "hold everything" in view of the plans for state-wide participation and coverage. This we did.

As usually happens, if one evidences interest in a subject it means more work. So I was included in the organizing committee. We went to Detroit to visit the Michigan Plan, to California to visit that plan, and to Boston to visit the Massachusetts Plan. The Committee, consisting of twenty-four men, met and the fight was on. Everybody agreed that such coverage was necessary, mostly because

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Read before the Ramsey County Medical Society, Saint Paul, Minnesota, May 27, 1957.

hie Its Past and Future

OLOF I. SOHLBERG, M.D.
Saint Paul, Minnesota

of the threat of socialization of medicine—*a real threat at that time*. It was felt that if we, the doctors of the state, offered a good prepayment plan, a method of budgeting for medical expenses, it could go far to stymie the trend toward socialization. The big argument was whether we should hire insurance companies to do it and we specify the terms, or if we should do it ourselves. Previous to this, insurance companies had been approached and all turned it down as a bad and uninsurable proposition—"we can't risk our policyholders' money on such a scheme." No comprehensive prepayment medical coverage existed before Blue Shield paved the way.

Finally, after days of meetings and much talk, it was decided nineteen to five that we, the Association, should go it alone. (The irreconcilable minority, favoring Insurance Companies, organized and took pot shots at us for a long time.) The money for the previous investigation, amounting to about $7,500, was furnished by the State Medical Association.

In 1945 the Legislature, prodded by Mr. F. Manley Brist, then attorney for the State Association, passed the special enabling act which created the Blue Shield. It stated that any twenty-one, duly-licensed and qualified, practicing Doctors of Medicine could start such a company, but that it had to have a minimum of $25,000. That looked formidable. Our critics said we should have $100,000. But with a little publicity, we sold notes of from $25 to $500 to members of the medical profession, and in a short time raised over $88,000, with much more being available. Response came from 920 physicians. The flood of checks was very inspiring. Criticism stopped at once when it was seen how easily and quickly the money was being raised.

At the suggestion of The Council it was decided to divorce the Blue Shield from the State Association as much as possible in order to avoid any legal entanglements. Blue Shield was an absolutely independent corporation. That is why the Blue Shield is a separate corporation and why the original Board of Incorporators (twenty-one men, two from each district and three at large) elects the Board of Directors from its membership (eleven men, one from each Councillor district and two at large). This division was made to keep the representation equal throughout the state and to avoid having domination by any part of the state. This was in response to a promise made to the Legislature, and we have tried to live up to that ever since.

We lifted the list of payments *en masse* from the Massachusetts Plan. They in turn had had specialty groups present figures from their respective members and had developed their list of payments from that. We asked the Blue Cross to run it for us until we could develop our own machin-

ery. They did and we prospered. We paid back the State Association its $7,500 and each and every doctor got his money back with 4 per cent interest. *So we owed no one.* In fact, the only money now in Blue Shield is that paid in by the policyholders. In remembering the long hours of work during those days I wonder, now, how we did it. Meetings lasting from two or three in the afternoon to one, two or three o'clock in the morning were the rule. We were all amateurs and had to learn the hard way. We learned "to make haste slowly." We knew it was not our money that we were handling and that insurance companies (and others) figured Blue Shield, being run by amateurs, would fall flat on its face.

The first premiums were $1.00 per individual and $2.25 per family, per month. We sold only in groups to start with. The first group was the Farm Bureau Federation with 40,000 people. We have been grateful to them ever since. Then we spread out.

In 1950 Dr. Edwin Simons of Swanville was asked to be our Executive Director on a full-time basis. He did a splendid job and still does. Then in January, 1954, we cut loose from the Blue Cross and now run everything ourselves except the actual mechanics of the operation and sale of policies. Today we process over 1,800 claims every working day. We paid out almost $7 million to the doctors of the state in 1956, over $9 million in 1957, and have paid over $40 million since 1947. Over 880,000 people are now covered. In 1954 the "B Plan" was presented, after over two years of study and planning had gone into it. Since the Blue Shield had started, inflation had occurred, so that by that time, only 20 per cent of the people of the state were covered. The Board thought everybody would welcome the changes incorporated in the "B Plan"—a 50 per cent increase in premiums and a 50 per cent increase in payments to doctors. So the controversy which developed in Duluth was a surprise. However, wisdom prevailed and the "B Plan" remained in effect. It now covers over 90,000 people. It is a self-supporting part and is doing well.

The Blue Shield is a going concern. But do you know *that it is not insurance?* It looks like insurance, *but it is not!* Six State Supreme Courts have so decided. It is a *pre-payment service plan* to help people to budget in advance for medical service. That is why we are *not* under the Insurance Commissioner, who is an *appointed* officer. But the Insurance Commissioner inspects our books and records once a year and makes suggestions. When we want to make a change in premiums or benefits we must receive the approval of the State Attorney General. This is a nice arrangement and so far has worked well.

Payments to doctors have been increased steadily year by year as fast as we could seem to afford it. Over 250 such increases have been made. We have met with the specialty groups for the last three years and have tried to incorporate their suggestions into our thinking. Utilization had increased and with increased payments the margin between income and outgo had narrowed down so much that something had to be done about it. So again, after long and careful deliberation, it was decided to increase our premiums by 15c per month for the individual and 50c for the family.

This is our *second* rate increase in nine and one-half years, and went into effect on July 1, 1957. This improved the financial structure and made possible more increased payments. That should be pleasing to doctors and subscribers alike. Nowhere else does the subscriber get as much for his money. The overhead remains at about 10 per cent so the subscriber has 90c out of every dollar available for payments.

Minnesota ranks about eighteenth in population of all the forty-eight states and our Blue Shield is tenth in size of all the similar organizations in the United States. The Blue Shield has about $5 million in government securities and other investments. The income from this is used currently to help make payments and is not allowed to accumulate. The Board thinks that the money is the subscriber's and should be used for his benefit.

There are about sixty-eight Blue Shield Plans throughout the country and they have organized a national organization. This organization was formed for three reasons:

(1) To talk over mutual problems and to exchange experiences.

(2) To take over national accounts, such as General Motors, Ford Motors, U. S. Steel and so on, who have many employes throughout the country and who want uniform coverage.

(3) To take care of national advertising. It has been found that this costs so little, and the benefits are so great that it has paid to advertise not only nationally, but locally as well. Advertising, for instance this year, was 22 cents per contract

per year. I mention this because the question has been asked if Blue Shield couldn't pay more if the advertising was cut out. This amounts to $64,000 per year or .5 per cent a month per contract.

In addition, there is a district organization, composed of Plans from Nebraska, Iowa, North Dakota, Wisconsin and Minnesota, organized for the same purpose as the national one, but on a more limited scale. This is the 10th District group.

What is the Future for Blue Shield?

The Blue Shield has carried the medical profession away from a disastrous situation—government insurance. But, there is still grave danger of getting back into it again. That danger is far from over. In the days before the depression and the threat of socialization in the 30's there was a good doctor-patient relationship with no concern for health insurance or Blue Shield. Doctors liked to practice medicine with no government interference. This was the relation of *one* doctor to many patients. Most of them paid, some paid a little, and some not at all. But in those days it balanced off and no one worried much about it.

Then came the depression. The doctor took care of as many people as ever, but the paying part dwindled fast. It is well known that the low income group need the most care per capita for obvious reasons. The situation got worse and worse.

Doctors then turned to insurance companies and this is what happened. Some years ago Dr. Elmer Hess, past president of the AMA said:

"Several years ago, before there was any idea of a Blue Shield and there was not much of what is now known as the Blue Cross, I was among a delegation of physicians who went East to confer with high officials in the insurance industry. Our mission was to try to encourage the insurance companies to enter a new field of endeavor that some of us thought would soon become popular and also serve a socio-economic need. That mission did not provide us with too much fondness for the so-called big insurance interests. My colleagues and I were sent by the then officials of the AMA to try to interest some high officials of the insurance companies to enter the field of hospital expense and possible surgical expense benefits. We had an audience that was dignified. With firmness that was equal to the dignity with which we were received, we were told that we were proposing something about which little was known. Moreover, the insurance men implied there were other problems of pressing importance and there was little reason to enter uncharted seas and risk unnecessarily policyholders' funds entrusted to them for safekeeping."

Well, you see, as I mentioned before, the doctors tried, but the insurance companies said "no" and for good basic reasons. These are the *principles* underlying all risk coverage:

(1) The rate must vary with the risk, (2) The rate must be equitable, (3) The risk must be certain for the group, but uncertain for the individual, (4) A person *must not benefit from the loss,* and (5) The loss must be sizable and infrequent.

The insurance companies saw the risk was predictable and that the risk was enormous. The people about whom the doctors were most concerned were those to whom they were offering care and free care at that. These people were sick and had to be taken care of and the doctors did it. The doctors were not asking the insurance companies to take care of the well, but to help to care for the sick. Those who needed it got it, but couldn't pay for it.

Something had to be done, and the Government offered to do it. The situation was rather desperate. So community coverage—Blue Shield—was the answer and still is. This means good risks and poor risks—all covered. The good ones carry the poor ones. (Complete coverage was tried in Michigan and Massachusetts and abandoned in 1942 as being unrealistic because at that time it would have cost $10.06 per month per person. A complete coverage means house and office calls and all medical services—diagnostic and therapeutic.) In 1945 and 1946 when we were starting medical service programs, we were relatively inexperienced. The basis of Blue Shield was limited coverage to start with, and a spread from there as experience warranted.

The Blue Shield (1) is organized in the community interest; (2) is sponsored by physicians; (3) is non-profit (no stockholders, no dividends); (4) is low in cost of administration (10.1 per cent now); (5) has community enrollment (good risks and poor risks alike, to spread costs); (6) has the same rate for any age and either sex; (7) has no increase in family rate because of growth of family (Blue Shield covers any sized family without any increase of premium; a family is a man and wife with no children, or any number of children); (8) has coverage *throughout life* (any person now covered may keep his coverage indefinitely if he keeps up his payments).

. . . *and just as important.*—(1) Fee for service.

(2) Free choice of physician. (3) No third-party interference.

This worked fine because of the principle of integrated risk. Sick people were protected and well persons covered. Then employers began to contribute and they wanted to vary coverage with their experience with "good" groups paying less and groups with higher utilization paying more. This breaks up the community risk idea. The trend towards this is increasing. As one man (Carl Fischer, Professor of Insurance at the University of Michigan) said, "Each company endeavors to secure as favorable a portion of the community as practicable . . . ." Now, the danger is that the good risks are being pulled away. The insurance companies are under-bidding for good risks and refusing to cover the poor risks. This destroys the community concept which is basic with Blue Shield.

The Health Foundation indicates that throughout the nation only 41 per cent of persons with incomes under $3,000 are covered and 80 per cent of families with an annual income of $5,000 or over. Poor risks can't support themselves. Therefore, again I stress the importance of community coverage.

A new factor is developing and the voice of the doctor is being stilled by attempted third-party domination—*employers* who pay and *unions* which dictate terms for employes by demanding broader and broader coverage of the individual.

Structure of Blue Shield

We now have (besides the Board of Directors consisting of eleven men, all Doctors of Medicine):

1. The Board of Incorporators. At first this consisted of twenty-one men chosen by The Council. The Board of Incorporators is being increased as rapidly as possible in multiples of nine in order to maintain the relative representation throughout the state and to keep faith with the Legislature. Nominees are appointed by The Council and elected by the Board. It is hoped that eventually the Board of Incorporators will be about as large as the House of Delegates and will include every component society in the State.

2. An Executive Committee composed of four members of the Board of Directors which meets between meetings of the entire Board.

3. A Finance Committee composed of three members.

4. An Enrollment Committee, of four members.

5. A Medical Advisory Committee.

6. A Liaison Committee.

Then we have organized:

1. A special Advisory Committee on Fees which has met with specialty groups to talk over their recommendations, most of which appear in our new schedule of payments.

2. Physicians' Review Committee, which consists of a member from each specialty group and two from the general practitioners' group, to review unusual claims.

The present plan is to draw on the Board of Incorporators to serve on these committees. This still has not been completely worked out.

We have now decided that physicians serving in hospitals and paid by them such as pathologists, roentgenologists and physiatrists are going to be paid by the Blue Shield. We feel that these are specialists in medicine and should be paid by Blue Shield and not by Blue Cross. This will increase the number of beds available and cut down on the expenses of Blue Cross a great deal.

Where You Come In

What can *we,* members of the medical profession in Minnesota, do about Blue Shield? *First,* we can become informed. The biggest difficulty is *lack of interest* and *lack of information* on the part of the average doctor. He has *opinions* but not *facts.* This is the universal complaint of those concerned with all Blue Shield plans. *Second,* we can *stress service benefits.* We can tell the people that *immediately apparent* benefits offered by insurance companies will not compare with the long-range benefits of Blue Shield, for example, subscribers can continue *after age sixty-five.* This non-cancellable feature is to be stressed. We can tell the people that *no one has had his Blue Shield policy cancelled because of heavy usage.* We can tell the people the greater proportion of good risks are in the middle income group, and if you sell them the idea of *service benefits,* Blue Shield will prosper. We can tell the people that Blue Shield pays out a larger proportion of their premium dollars in benefits than any insurance company.

Tell them of your plan, *one plan, the community plan, the Blue Shield.*

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1. Wright, W. T., Jr.; Pokorny, C., and Foster, T. L.: Kansas M. Soc. *57*:410, 1956. 2. Gilchrist, A. R.: Brit. M. J. *2*:1011 (Nov. 3), 1956. 3. Terman, L. A.: Illinois M. J. *3*:67, 1957.

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● *The creation of arteriovenous fistulas in children to cause lengthening of a short leg is but one of the many facets covered in this paper. The orthopedic surgeon, as well as any physician who deals with injured extremities, is particularly concerned with vascular trauma, because injuries to blood vessels can complicate what otherwise would be a relatively simple problem in orthopedics. This paper summarizes orthopedic interest in vascular surgery.*

Peripheral Vascular Surgery from the Standpoint of the Orthopedic Surgeon

JOSEPH M. JANES, M.D.
Rochester, Minnesota

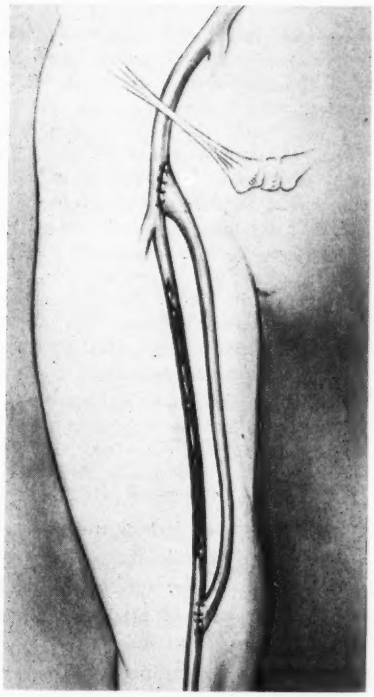


Fig. 5. Diagrammatic sketch of the bypass procedure.

SINCE World War II, renewed interest has arisen in vascular surgery in general. Orthopedists are particularly concerned with vascular surgery as it applies to the extremities with respect not only to traumatic conditions but also to other entities that shall be discussed in this presentation.

The importance of surgical treatment of blood vessels in orthopedics was well stated by Murray[1]: "Bones, muscles and nerves are necessary for function of an extremity but without blood vessels none of these will survive or function." There are three main reasons why orthopedists should be able to recognize and deal with almost every condition that affects the vascular system of the extremities. These are (1) diagnosis (when something is wrong with an extremity, the patient is often seen by an orthopedist), (2) treatment (if an operation is required, it is the orthopedist who should be most familiar with the anatomy of the extremities) and (3) aftercare (the orthopedist is most familiar with rehabilitation of the extremities).

From the Section of Orthopedic Surgery, Mayo Clinic and Mayo Foundation, Rochester, Minnesota.

The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

Congenital Vascular Problems

Of all the vascular lesions in the extremities concerning orthopedists, the congenital types are probably the most difficult with which to deal.

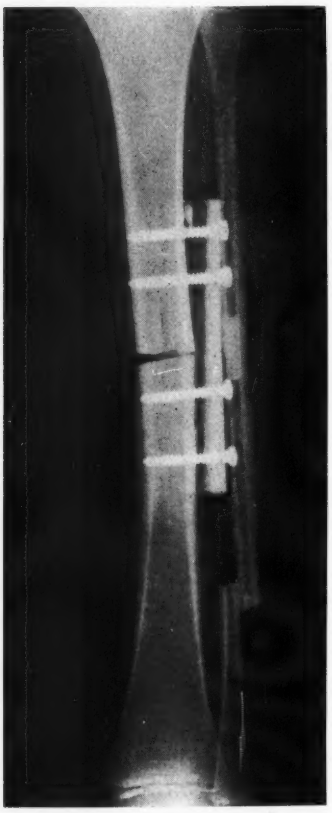


Fig. 1. Anteroposterior roentgenogram showing homologous onlay graft to tibia after resection of 4 cm. of that bone and osteotomy of the fibula.

Congenital Arteriovenous Fistula.—This condition is usually made manifest by an increase in the length and girth of an involved extremity when compared with the contralateral limb. The fistulas are usually multiple and, therefore, it is difficult to treat them surgically. Arteriography may be of use in the diagnosis. If these lesions show any localization at all, every effort should be made to remove them, even if removal requires multiple procedures. Amputation occasionally may be necessary.

The following concerns a patient who had congenital arteriovenous communications about the right astragalus.

A girl, aged eleven years, came to the Mayo Clinic in September, 1950. Her right lower extremity was 2.5 cm. longer than the left. The typical bruit of an arteriovenous fistula was heard just below the right ankle. The arteriogram showed arteriovenous communications about the right astragalus.

Three separate surgical procedures were necessary in order to remove all of the fistulous tissue. Stapling of the upper right tibial epiphysis was done in January, 1951. By June, 1952, the right lower extremity was only 1.3 cm. longer than the left. In 1955, at age sixteen, the right upper tibial epiphysis had closed; no thrill or bruit was present in the right foot, and the lower extremities were equal in length by direct measurement.

Even when it is impossible to remove all of the arteriovenous communications, stapling or epiphysiodesis may be done to check the abnormal longitudinal growth of bone.

Arteriography occasionally demonstrates that the arteriovenous communication is single. This is a fortunate circumstance in that the lesion may be removed by quadruple ligation excision or block dissection of the lesion.

An eight-year-old girl came to the clinic because her left lower extremity was 4 cm. longer than the right. The veins of the left leg were distended, and a port-wine stain was present over the heel. A to-and-fro murmur was heard over the lower portion of the left popliteal space. Roentgenograms of the left tibia showed a cystic zone in the middle portion of the shaft. An arteriogram showed what appeared to be a fistulous communication in the medullary cavity of the midtibia. There also appeared to be increased vascularity in the posterior portion of the foot. Resection of 4 cm. of the tibia, including the site of the fistula, was done, and the fibula was osteotomized, allowing the fibular fragments to override. A homologous tibial bone graft was applied to the tibial fragments (Fig. 1).

The bruit was abolished and the discrepancy in leg length was corrected at the same operation. It is possible that this patient may have trouble in the future because of the vascular anomaly in the foot.

As has been mentioned, amputation occasionally may be necessary, especially if an ulcer develops that refuses to heal. If the congenital arteriovenous communications are confined to a finger, amputation of the finger is all that is required. Amputation must, of course, be proximal to any arteriovenous communications. This may not be possible in diffuse disease that extends from an ex-

tremity into the trunk. Patients are encountered in whom the differentiation between multiple small arteriovenous fistulas and diffuse hemangiomas is extremely difficult.

Hemangiomas.—These are benign soft-tissue tumors of endothelial origin composed of blood-vessel elements in varying states of maturity. They are usually thought to be congenital and are commonly found in the extremities. They may be discrete or diffuse. Histologically, they are capillary or cavernous. Of ninety-three hemangiomas of the extremities reviewed by Johnson and associates[2] at the clinic, twenty were diffuse and seventy-three were discrete. In patients having discrete tumors, pain and the presence of a tissue mass were the commonest symptoms, while the presence of a palpable tissue mass was the commonest physical finding. In patients with diffuse tumors, pain and swelling, with obvious cosmetic changes, were the commonest features of the history, while a tender tissue mass was most often found on physical examination.

Roentgenographic changes that may be noted include the presence of a soft-tissue tumor, generalized osteoporosis, periosteal thickening, bony erosion and the presence of phleboliths.

All ninety-three patients reported on by Johnson's group underwent surgical excision of the hemangiomas. After operation, 75 per cent of those whose tumors had been discrete became symptomless but all of those whose tumors had been diffuse still had symptoms, illustrating the difficulty of treating diffuse hemangiomas surgically.

Other types of treatment for hemangioma have included (1) injection directly into the tumor of sclerosing agents such as a solution of urethan and quinine hydrochloride and a 50 per cent solution of glucose, (2) topical application of agents such as carbon dioxide snow, (3) roentgen and radium therapy (although it is doubtful if this should be used in children) and (4) electrocoagulation.

Traumatic Vascular Conditions

It is in the field of trauma that the relationship of the arterial supply to surgery of the extremities is most vital to the orthopedist. Although most of the vascular lesions due to trauma are seen in wartime, physicians are seeing more and more of these problems in civilian life due to increased mechanization and high-speed travel, not to mention accidents with firearms.

The four cardinal principles in dealing with a peripheral arterial emergency are (1) do not delay, (2) do not heat, (3) do not elevate and (4) do not refrigerate.

Supracondylar Fracture of the Elbow in Children.—As in all fractures and dislocations of the major bones and joints of the extremities, the status of the nerve and blood supply distal to the injury should be determined immediately. If the radial pulse is not palpable after a supracondylar fracture, it may become so after closed reduction of the fracture. If this is the case, routine treatment may be followed, care being taken to watch the state of the circulation closely for at least 48 hours. If the pulse does not return after manipulation or if it disappears after manipulation and signs of early ischemia begin, such as pain, swelling, coldness, cyanosis or pallor and loss of finger motion, definite action is indicated. If evidence of circulatory embarrassment persists after the flexion of the elbow has been lessened and the constricting bandages removed, the lower portion of the brachial artery should be explored. Some surgeons[3] advocate preliminary traction and sympathetic block, but I sleep better when I know that the cause of the trouble has been eliminated. On exposure of the brachial artery, one of the following conditions may be found: (1) the artery may be in spasm, (2) it may be contused, with resultant thrombus formation, (3) it may be lacerated or (4) it may be completely severed.

If the artery is in spasm, bathing it with warm isotonic solution of sodium chloride or procaine hydrochloride or wrapping it with a sponge soaked in a 2.5 per cent solution of papaverine sulfate[4] often brings about relaxation of the spasm. If the artery has been contused so that the intima has been damaged, leading to thrombus formation, arteriectomy is advised.[5] My associates and I have not found it necessary to restore the continuity of the artery in this region; instead, simple ligation of the divided ends of the artery has sufficed, because the collateral circulation about the elbow is adequate.

If the artery has been lacerated by a spicule of bone, it is better to divide the vessel completely. Complete division is preferable because the vessel is small and suturing of the laceration would reduce the size of the lumen, thus predisposing it to the formation of a thrombus. If the artery has been divided completely, each end is ligated. We

prefer to use transfixing sutures of number 0 braided silk. If the artery has been lacerated or completely divided, there will, of course, be a hematoma to be evacuated. After the artery has been dealt with, the fractured bone usually can be held in place without internal fixation. The wound is loosely closed, and a massive dressing is applied with a posterior plaster splint to hold the elbow joint at an angle of about 90 degrees.

Rupture of the brachial artery may occur as a result of dislocation of the elbow.[6] This situation is dealt with as has just been mentioned. After vascular injuries in the region of the elbow, or anywhere in the extremities for that matter, the postoperative blood pressure should be maintained at or near a normal level. Heating or elevating the involved limb should be avoided. A heat cradle over the abdomen, together with the administration of papaverine or alcohol, may be utilized to advantage in promoting collateral circulation, providing the blood pressure is maintained at a normal level. Alcohol should not be given to children. Paravertebral sympathetic block is transient in effect and is not considered necessary, as pointed out by Linton,[7] since division of the artery in itself accomplishes an effective periarterial sympathectomy, to which sympathetic block or sympathetic ganglionectomy as an emergency procedure adds little benefit.

Dislocation of the Knee.—This occurs more rarely than does dislocation of the elbow. When anterior or posterior dislocation of the knee occurs, the popliteal vessels are in grave danger of rupture. When the knee has been extended to a right angle and the leg is swollen, bluish, cold and pulseless, it is almost certain that vascular damage has occurred. After reduction of the dislocation, immediate exploration of the popliteal space is indicated. The artery may be in spasm, it may be damaged so that no blood is flowing through it or, more likely, it may be completely severed. Measures already enumerated in connection with injuries to the brachial artery are indicated except that an effort must be made in this situation to restore the continuity of the artery. If the popliteal artery has been ruptured, a huge amount of clotted blood will burst forth under pressure on exploration and bright-red blood will appear.

As just mentioned, a supreme effort should be made to restore the continuity of the artery under such conditions if this is technically feasible. An autogenous vein graft, a homologous arterial graft or possibly an Edwards-Tapp teflon prosthesis[8] may be used to bridge the gap. It is important to débride any damaged artery. This usually precludes bringing the ends together for direct suture.

If grafting is not possible and ligation of the divided ends of the artery is necessary, all the means available to promote collateral circulation should be used. The limb is placed in a modified Robert Jones protective dressing to which a posterior plaster slab has been applied. The limb is not elevated nor is heat applied. In general, results of arterial injury after dislocation of the knee have not been good so far as saving the extremity is concerned.

Fracture Through the Upper Third of the Tibia.—This fracture can jeopardize the arterial supply to the distal portion of the leg and the foot because of the proximity of the bifurcation of the popliteal artery. Amputation as a rule is necessary when an extremity has been fractured at or beyond the arterial injury. In such cases, however, the surgeon should make a supreme effort to restore the arterial continuity; if that is not possible, all means should be used to promote the collateral circulation to its highest state of efficiency. West and associates[9] reported a successful outcome in a case of fractured femur and disruption of the superficial femoral artery in which arterial continuity was restored by means of an autogenous vein graft.

To illustrate how closely allied peripheral vascular surgery is to orthopedics, I should like to mention the effect of a ridge in a cast in the popliteal region. In this instance, the cast apparently had been allowed to bend while it was being applied. The patient, who had sustained a simple fracture of the tibial shaft, complained of severe pain for two days. When the cast was removed, the leg was gangrenous and amputation above the knee was necessary. Examination of the specimen revealed pronounced venous thrombosis likely due to venous obstruction.

Direct Injury to Vessels.—The orthopedist may be confronted with an extremity that has been penetrated by a bullet, a knife or other sharp objects; wounds caused by miscellaneous sharp objects are increasing in this era of faster travel. The main artery may be completely divided, lacerated or contused, with resultant thrombosis, or put into a state of spasm.

Complete Severance.—As a first-aid measure,

direct pressure on the artery above the wound will control most of the bleeding when an artery is severed. Immediate exploration is indicated in such cases. When a large artery, such as the common femoral or popliteal, has been completely severed, consideration must be given to restoration of the continuity of the vessel. The divided ends of the artery occasionally may be brought together for direct suture. When this is not possible, a graft is necessary. This may take the form of an autogenous vein graft, for which the companion vein,

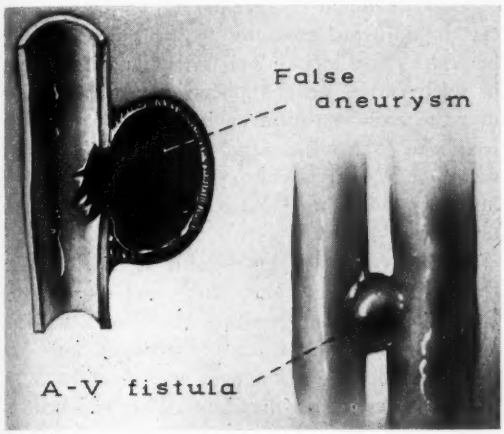


Fig. 2. False aneurysm and arteriovenous fistula.

the external jugular vein or a section of the saphenous vein may be used. In grafting the vein into the arterial system, the vessel should be reversed so that valves, if present, will not impede the flow of blood. A homologous arterial graft may be used. Currently, I am using a woven teflon prosthesis. In the case of smaller arteries, such as those below the elbow and the knee, ligation after complete severance usually may be done without impairing the distal arterial supply.

Laceration.—Arteries may be lacerated from a sharp object, such as a spicule of bone. If the condition is recognized early and repair of the laceration is carried out, the development of a false aneurysm or an arteriovenous fistula may be forestalled.

When the laceration involves a major artery, it is often possible to close the rent by lateral vascular suture with 00000 or 000000 silk on an atraumatic needle. Care must be taken not to constrict the lumen. It is often better to divide the artery completely and bring the ends together for end-to-end suture.

In laceration of smaller arteries, it is best to divide the vessel completely and ligate the ends rather than attempt to suture the rent.



Fig. 3. Arteriogram showing traumatic, or false, aneurysm.

If it is known that spurting bright-red blood or rapid expansion of a limb has occurred after a penetrating injury, it is best to explore. If this is not done, the surgeon may be confronted later with the problem of a delayed traumatic aneurysm or a traumatic arteriovenous fistula, depending on whether the artery or both the artery and vein have been perforated (Fig. 2).

Traumatic Aneurysm.—The clinical features of an aneurysm are globular pulsating swelling, distinct thrill and systolic murmur, congestion and edema of the distal parts, pain and disturbance of sensation, and erosion phenomena. Not all of these features may be present in every case.

Arterial aneurysms are more difficult to deal with than are arteriovenous fistulas because the collateral circulation does not develop as well in the former as in the latter. In the upper extremity,

extirpation of the aneurysm is usually a safe procedure.[10] If in doubt, the appropriate type of sympathectomy may be done. In the larger arteries

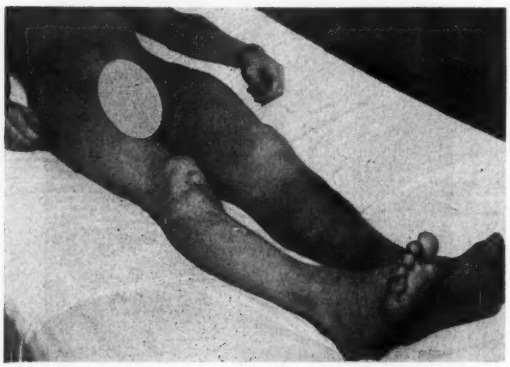


Fig. 4. A sixteen-year-old boy with a traumatic arteriovenous fistula of the left common femoral artery and vein.

of the lower extremity, extirpation and grafting may be necessary.

Figure 3 is an arteriogram of a traumatic, or false, aneurysm. In this case, the superficial femoral artery had been lacerated by a jackknife. The bleeding was controlled by pressure. Immediate exploration, with repair of the vessel, was not done. Later, pulsatile swelling developed indicative of a traumatic aneurysm, and a surgical procedure was then necessary to repair the vessel. The ultimate result was satisfactory.

Arteriovenous Fistulas.—Acquired arteriovenous fistulas seen in the past most often were caused by gunshot or stab wounds. With the increased incidence of serious automobile and airplane accidents, arteriovenous fistulas are being seen from these causes.

The local signs of an arteriovenous fistula are a pulsating lump, dilatation of veins, and a characteristic thrill and murmur. Arteriography is useful in arteriovenous fistulas in indicating the site of the communication.

Figure 4 shows a sixteen-year-old boy with an arteriovenous fistula following a gunshot wound two years previously. Note the enlargement of the involved extremity in both circumference and length.

Collateral circulation develops well in the presence of arteriovenous fistulas. This allows for treatment by the so-called quadruple ligation excision procedure.

It has been advised recently that the continuity of the artery be restored.[11] This procedure appears to be more applicable to recently acquired arteriovenous fistulas than to those of many years' duration. When the communication is a direct one, as in the case of a created arteriovenous fistula, the aperture in the artery may be repaired by a transvenous approach. The artery is repaired as one would repair an arterial laceration, and the vein is sacrificed.

Adjuvant Measures.—In addition to the direct surgical treatment of peripheral vascular injuries, certain adjuvant measures of treatment may be helpful. These include heparinization (if this can be safely carried out), application of a heat cradle over the abdomen, intravenous or intra-arterial injection of papaverine, administration of alcohol by mouth or by vein, use of oxygen, and wrapping the limb loosely in a modified Robert Jones protective dressing.

The ingredients of this dressing are as follows in the order of application: sheet wadding to hold the wound dressing in place, abundant absorbent cotton, eider-down or Kerlix bandages, and Ace bandages. The Ace bandages may be omitted. A posterior plaster slab may be applied and kept in place with a 10-cm. gauze bandage that has been soaked in water.

Occlusive Vascular Disease

As the average age of the population continues to increase, physicians will be confronted more and more with patients having symptoms due to occlusive vascular disease.

Arteriosclerosis Obliterans. Segmental Occlusion.—The clinical picture in segmental occlusion may vary considerably depending on the site of the early lesion and the degree of occlusion produced. Arteriography is helpful in determining the site of the occlusion. Blockage of the distal part of the aorta or great iliac arteries may give rise to pain in the back or to claudication about the hip.

Orthopedists often are asked to see patients who are considered to have a protruded intervertebral disk in the lower part of the lumbar region. After a history has been taken carefully and examination and aortography have been done, such a patient may be found to have occlusion of the terminal portion of the aorta or of one of the great arteries within the pelvis.

Occlusion of the femoral artery may cause claudication in the thigh, but more often the pain occurs in the calf of the leg.

Time does not permit discussion of the various surgical procedures that may be done in segmental arterial occlusion. When the involvement is above the inguinal ligament as well as below, it is desirable to co-operate with a general surgeon who is interested in vascular surgery.

In the management of segmental occlusion of the superficial femoral artery, it is our practice at present to bypass[12] the occluded segment with either a homologous arterial graft or a woven teflon prosthesis. There must be a good "run-in" of blood as well as a good "runoff" before the bypass operation is considered (Fig. 5).†

Rob[13] has stated that arterial reconstruction is the treatment of choice for patients who have pain at rest and gangrene, because the alternative is usually a major operation. In his experience, such a procedure is possible in about 20 per cent of patients with gangrene of the toes and feet. He pointed out that a patient with gangrene and clinical evidence of aortoiliac and femoropopliteal thrombosis should have an arteriogram to see if the limb might be saved.

Diffuse Involvement.—When diffuse involvement is present in arteriosclerosis obliterans and intolerable ischemia exists, the surgical treatment is amputation. In such an event, it is desirable that amputation be done so that the stump is below the knee. Our practice in most instances is to begin at the site of election below the knee. If brisk bleeding does not occur and the muscle is pale and bloodless, amputation above the knee is carried out. We have had poor success with amputation of the toes in arteriosclerosis obliterans and not much better success with the transmetatarsal procedure in this disease.

Peripheral Arteriosclerotic Aneurysms.—These lesions should be dealt with before complications appear. The complications include thrombosis, embolism, gangrene, pressure on veins and nerves, and rupture. Treatment of such an aneurysm of the common femoral artery is difficult. It may be accomplished on occasions by extirpation or obliteration of the aneurysm, with restoration of the arterial flow by the bypass technique. When the arteriosclerotic aneurysm occurs elsewhere than in the region just mentioned, it has been our practice[14] to do the appropriate sympathectomy or alcohol sympathetic block and extirpation of the aneurysm at the same operative session. In a few cases of arteriosclerotic popliteal aneurysm, we have bypassed the aneurysm and either extirpated it or obliterated it.

Thromboangiitis Obliterans. — This condition usually occurs in younger persons than does arteriosclerosis obliterans. Direct surgical attack on the vessels in thromboangiitis obliterans as a rule is confined to biopsy of an easily accessible artery to establish a diagnosis. Such a specimen most often is taken from the distal portion of an occluded ulnar artery. Major surgical treatment in thromboangiitis obliterans usually is limited to sympathectomy. Whereas conservatism in amputation in the presence of arteriosclerosis obliterans is not advised, quite the reverse is true in thromboangiitis obliterans. Amputation of all or a part of one or more digits often will succeed in thromboangiitis obliterans, even though at times the healing will be slow.

Arterial Embolism.—This is the most dramatic form of arterial occlusion. The common origins of the embolus are (1) left auricular clots that form during fibrillation, (2) ventricular mural thrombi present over a myocardial infarct and (3) aortic mural thrombi forming over ulcerated atherosclerotic plaques. The clinical features of peripheral arterial embolism are pain, blanching, tingling, cold, anesthesia, loss of power and loss of pulsation.

Early vigorous medical treatment may prove successful. If, however, signs of returning circulation are not evident in two or three hours, it is probable that embolectomy should be done. The common site of lodgment of the embolus is at one of the major bifurcations.

Embolectomy in most cases can be done with the patient under local anesthesia. The incision should be adequate and should be made over the line of the artery. Bony parts, such as the clavicle or upper part of the fibula, can be removed to gain good exposure, as advised by Elkin and Cooper.[15] The incision is developed so that an adequate segment of normal artery is present above and below the site of obstruction. Cotton tapes or arterial clamps are placed around the artery above and below the intended site of arteriotomy to control the flow of blood and to prevent distal embolization.

A word of caution is in order in concluding this

†See page 105.

discussion of occlusive vascular disease. Patients suffering from this condition are not good candidates for elective orthopedic procedures on the extremities.

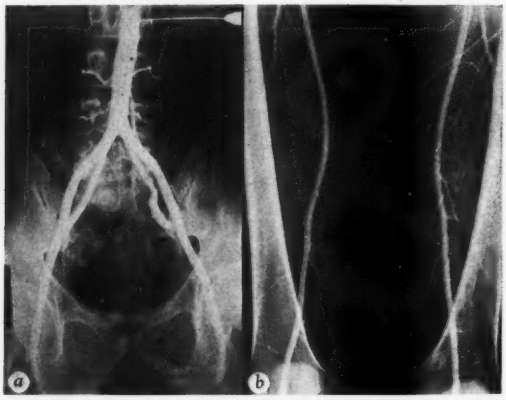


Fig. 6. *(a)* Aortogram showing normal pelvic arteries. *(b)* Aortogram showing normal thigh arteries.

Arteriography

The first arteriogram on a living person was carried out in 1923.[16] It has been said that about 85 per cent of the affections of the peripheral arteries can be diagnosed correctly after a good history has been taken and physical examination has been done. According to Learmonth,[17] the purpose of outlining the peripheral arterial tree by an opaque medium includes the demonstration of (1) its anatomic arrangement, whether normal or abnormal, (2) the presence of local irregularities in caliber in arteriosclerosis or thromboangiitis obliterans, (3) thrombotic blockage of main trunks in obliterative vascular disease, (4) the extent of the collateral circulation, (5) the site and extent of arterial aneurysms and (6) the site of arteriovenous fistulas.

Two methods of injecting radiopaque material into the artery may be used: (1) the needle is inserted through the skin and underlying tissues into the artery (closed method) or (2) an incision is made down to the artery and the needle is inserted under direct vision (open method).

The open method has three definite advantages, namely (1) the artery is entered readily with the needle without undue trauma, (2) the chance of extravascular injection of the radiopaque substance is minimized and (3) a cotton tape may be placed proximally to the point of arterial puncture so that the arterial flow may be occluded at the moment of injection. This allows for a heavy concentration of radiopaque material and thus a better arteriogram.

Although my associates and I use both the open and closed methods, the description of the technique will be limited to the open method. The procedure is carried out in the operating room. A test dose of a 35 per cent solution of iodopyracet (diodrast) is injected intradermally on the volar aspect of one of the patient's forearms. If a cutaneous reaction has not occurred at the end of fifteen minutes, arteriography is carried out.

When arteriography is to be done on one or both of the lower extremities, it is often convenient to use a fracture table, which facilitates quick handling of the cassettes. However, the usual operating table or a regular x-ray table may be used.

The extremity on which the arteriogram is to be made is slightly rotated externally. When the fracture table is used, two x-ray machines are placed so as to take roentgenograms in two planes or two slightly oblique views at different levels of the extremity.

The patient is anesthetized by the intravenous injection of a solution of thiopental (pentothal) sodium. A dose of 1 ml. (20 mg.) of succinyl choline may be given just prior to the injection of the radiopaque material to prevent any motion of the extremity while the arteriogram is being made.

An incision 7.5 to 10 cm. in length is made over the common femoral artery. The artery is carefully isolated and a cotton tape that has been soaked in an isotonic solution of sodium chloride is then placed around it. Approximately 50 ml. of a 35 per cent solution of diodrast is drawn up into a 50-ml. syringe fitted with 25 cm. of rubber tubing to which a 15 or 17-gauge needle is attached. The tubing allows for various motions of the syringe without disturbing the needle within the artery. While an assistant obstructs the arterial flow by gentle traction on the tape, 40 ml. of diodrast is injected and a roentgenogram is made while the remaining 10 ml. of the medium is being injected. Various modifications as to timing and projections are necessary according to the condition that is clinically suspected to be present. Close co-operation with the x-ray technician is imperative. After the needle has been withdrawn, a pledget of gelfoam is held over the opening in the artery until there is no further bleeding.

When the digital arteries of the hand or vessels

of the forearm are to be visualized, the extremity may be kept flat on the cassette by placing a used x-ray film over the hand and pressing each side of this film down to the table with sandbags, one on each side of the hand.

A 7.5-cm. incision is made over the middle portion of the brachial artery with the patient under pentothal anesthesia. Care is taken not to injure the median nerve. The rest of the procedure is essentially the same as has been outlined for arteriography in the lower extremity.

The roentgenologic technique that we have employed is as follows: for the hand and forearm, 20 milliamperes, 80 kilovolts, a distance of 80 cm. (32 inches) and an exposure of 1/20 second; for the lower extremity, 20 milliamperes, 90 kilovolts, a distance of 80 cm. (32 inches) and an exposure of 1/10 to 3/20 second. Examples of arteriograms are shown in Figures 6, 7 and 8.



Fig. 7. *(a)* Arteriogram showing normal popliteal artery pushed posteriorly by a soft-tissue mass. *(b)* Arteriogram showing occlusion of the lower femoral artery due to injury by bird shot. *(c)* Arteriogram of arteriosclerotic popliteal aneurysm.

Persons doing arteriography should have some regard for exposure to roentgen rays. A lead apron should be worn, and sufficient rubber tubing should be used on the syringe so that the hands of the person making the injection may be kept as far out of the field as possible. A lead shield may be placed between the surgeon and the patient.

Problem of Leg Length

An experimental aspect of the relationship between peripheral vascular surgery and orthopedics is the creation of an arteriovenous fistula for the purpose of stimulating the longitudinal growth of bone.

The problem of the short leg in a child, from whatever cause, always has been challenging to orthopedists. It has been observed that patients who have a congenital arteriovenous communication or communications often have a longer extremity on the affected side. Likewise, I have observed longer extremities in patients who have arteriovenous fistulas acquired before epiphyseal closure. Thus, it was considered reasonable to attempt to increase leg length in puppies by creating an arteriovenous fistula between the major vessels of one of the hind legs. Work was begun on this problem in 1947.[18] That this is not an original idea was brought to my attention by Dr. J. R. Moore, who told me that Dr. R. B. Osgood, in 1929, after examining a child with an elongated extremity due to an arteriovenous fistula, mentioned the possibility of harnessing this abnormal vascular correlation to stimulate the growth of bone.



Fig. 8. *(a)* Arteriogram in a case of thromboangiitis obliterans. *(b)* Arteriogram in a case of fibrosarcoma.

Arteriovenous fistulas about 1.25 cm. in length were made between the left external iliac artery and vein in ten puppies. In nine of ten animals, the left femur (side of the fistula) was longer than the right at necropsy. In six of ten animals, the left tibia was longer than the right one. The weights of the left femora and tibiae compared with those of the right femora and tibiae roughly paralleled the differences in size. In four animals in which the difference in temperature in the

medullary cavities of the left and right femora was recorded, the left one was warmer in each instance.

After some delay and with considerable trepidation, my colleagues and I considered applying the procedure to a child with a short lower extremity. Among reasons for the delay were the observations that the increase in the leg lengths of these puppies was not great and that in one case the left hind leg turned out to be shorter than the right, and the fact that we were not sure of the effect on the heart.

The first fistula in such a patient was created at the clinic in 1950, after the parents of the child were fully briefed on the subject. They understood that two operations would be involved, one to make the fistula and a second one later to repair it. They were also made aware of the possible complications.

To date, we have created forty-five such arteriovenous fistulas, ten of which have been repaired. Dr. Howard Burchell, one of the cardiologists at the clinic, has carefully followed these patients. Cardiac complications have not appeared to date. No restriction has been placed on the activities of the children who have undergone the procedure. None of the local complications described in connection with arteriovenous fistulas have been observed, with the exception of mild to moderate venous stasis. In cases of short leg due to anterior poliomyelitis, this stasis has not been unwelcome to the parents or the child, as it has caused filling out of the atrophied limb so that it approaches the other in appearance. It is not intended to allow the fistula to operate for a long enough period to produce unwanted changes resulting from venous stasis.

We are not in a position to give a final report on this series of patients, as many are still in the actively growing period. Stimulation of the growth of the short extremity has varied all the way from zero to a 4-cm. "catch up" over a four-year period. It has become apparent that the creation of fistulas in patients more than twelve years of age is not indicated except when the procedure is accompanied by stapling, or epiphysiodesis, of the normal extremity. The youngest patient in our series was four years of age. The parents or the patients uniformly have noted that the thigh and upper half of the leg on the side of the fistula are warmer than they were before operation.

Several problems with regard to this work remain unanswered: 1. How much stimulation of growth can be expected? 2. When should the fistula be induced? 3. How long should it be left in operation? 4. Will stunting of growth occur in some patients, as was noted in one of the dogs? This method of attempted equalization of leg length is still in the experimental phase, and this must be realized by the parents who submit their children to it as well as by the surgeon who carries it out. We hope to have more data on this work as time goes on. The procedure is not recommended for a shortened upper extremity.

References

1. Murray, Gordon: Symposium on vascular problems: Surgical repair of injuries to main arteries. Am. J. Surg., 83:480-483 (Mar.) 1952.
2. Johnson, E. W., Jr., Ghormley, R. K. and Dockerty, M. B.: Hemangiomas of the extremities. Surg., Gynec. & Obst., 102:531-538 (May) 1956.
3. Blount, W. P.: Fractures in Children. Baltimore: The Williams & Wilkins Company, 1954, 279 pp.
4. Kinmonth, J. B.: Physiology and relief of traumatic arterial spasm. Brit. M. J., 1:59-64 (Jan. 12) 1952.
5. Leriche, R., and Heitz, J.: De la réaction vasodilatatrice consécutive a la résection d'un segment artérial oblitéré. Compt. rend. Soc. de biol., 80:160-162 (Feb. 3) 1917.
6. Spear, H. C. and Janes, J. M.: Rupture of the brachial artery accompanying dislocation of the elbow or supracondylar fracture. J. Bone & Joint Surg., 33-A:889-894 (Oct.) 1951.
7. Linton, R. R.: Injuries to major arteries and their treatment. New York J. Med., 49:2039-2048 (Sept. 1) 1949.
8. Edwards, W. S.: Plastic Arterial Grafts. Springfield: Charles C Thomas, 1957, 126 pp.
9. West, J. P., Winant, E. M. and Blair, C. R.: Femoral-artery reconstruction in a patient with a compound fracture of the femur. J. Bone & Joint Surg., 39-A:1394-1397 (Dec.) 1957.
10. Janes, J. M.: Symposium on recent advances in surgical treatment of aneurysms: The treatment of peripheral aneurysms. Proc. Staff Meet., Mayo Clin., 28:718-722 (Dec. 16) 1953.
11. Foley, P. J., Allen, E. V. and Janes, J. M.: Surgical treatment of acquired arteriovenous fistula. Am. J. Surg., 91:611-617 (Apr.) 1956.
12. Linton, R. R.: Some practical considerations in the surgery of blood vessel grafts. Surgery, 38:817-834 (Nov.) 1955.
13. Rob, C.: Place of direct surgery in treatment of obliterative arterial disease. Brit. M. J., 2:1027-1029 (Nov. 3) 1956.
14. Janes, J. M. and Ivins, J. C.: Method of dealing with arteriosclerotic popliteal aneurysms. Surgery, 29:398-406 (Mar.) 1951.
15. Elkin, D. C. and Cooper, F. W., Jr.: Resection of clavicle in vascular surgery. J. Bone & Joint Surg., 28:117-119 (Jan.) 1946.
16. Camp, J. D. and Allen, E. V.: Angiography. *In* Golden, Ross: Diagnostic Roentgenology. Baltimore: The Williams & Wilkins Company, 1956, vol. 3, pp. 1143-1168.
17. Learmonth, J. R.: Arteriography of peripheral vessels: Technical details. Lancet, 2:745-746 (Dec. 9) 1944.
18. Janes, J. M. and Musgrove, J. E.: Effect of arteriovenous fistula on growth of bone: Experimental study. S. Clin. North America, 30:1191-1200 (Aug.) 1950.

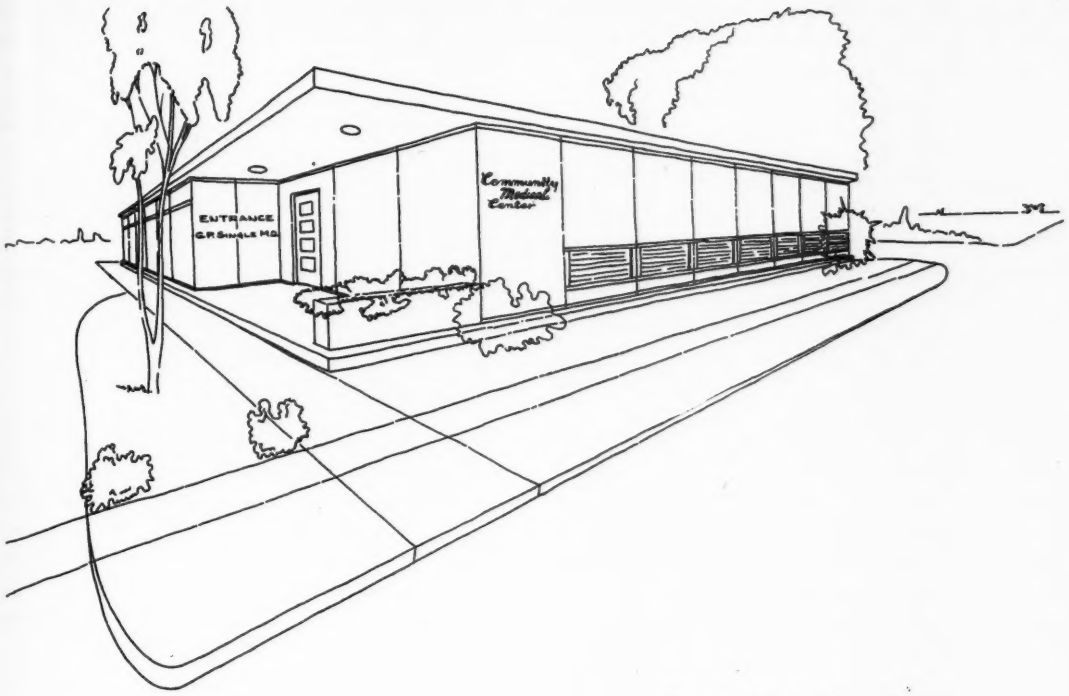


Fig. 1. Exterior view of center.

A Community Medical Assistance Plan

● *Medical practice in small towns does not appeal to many eager young graduates of modern medical schools. As a result, many communities are left without physicians as the older generation of practitioners dies. The Sears-Roebuck Foundation has developed plans to aid such communities to establish their needs and obtain physicians on a self-help basis.*

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The Mayo Foundation is a part of the Graduate School of the University of Minnesota.

THE popular picture of rural practice is that of the elderly physician with his little black bag—a man and his community with mutual confidence. Some of us can remember that far back, while others probably have conceived it from watching television "Westerns."

This picture is different from the concept our interns and general-practice residents have of medical practice today. For them the small-town practice is far from attractive, which is why they flock to the already overcrowded cities to start their practice, to the detriment of rural medicine. This is why hundreds of our smaller towns, once adequately taken care of by local physicians, now

find themselves dependent medically on the nearest city. This means driving several miles to see the doctor, and because of the distance frequently the trip is not made when it should have been. Emergency medical care is practically nonexistent.

The Medical Advisory Board of the Sears-Roebuck Foundation (a board of thirteen physicians appointed by the American Medical Association) asked the Foundation to study the problem and if possible to assist in solving it.

The Foundation first checked the experience of young physicians who fairly recently have started their practice in a small town, to find out why they decided on the small town, and what has been their success since they started.

First, they found most of these were originally from small towns or rural areas. They liked the small-town way of life.

Second, some of these physicians were not too successful. A few were even thinking of moving elsewhere. In practically every such case, the physician had quietly moved into town, taken over the office space of the former physician and hung out his shingle. Although the space had satisfied the former physician for twenty to thirty years, it was not a facility where modern medicine could be practiced adequately. It compared ruefully with the facilities occupied by city physicians. During the time since the former physician died and the new one arrived the people in the area had made contacts with the city physicians, and mainly because of the better facilities they continued going to the city for their general ills. Of course they would employ the services of the local physician for emergencies and house calls, but a physician cannot live on that alone.

Now, how does one overcome the medical habits of a community? The Sears-Roebuck Foundation feels that it has the answer. It is the building of a modern medical center. Modern medicine requires modern diagnostic facilities. The day of practicing from the "little black bag" or using space up above the bank or converting a store building simply will not enable a physician to practice the way he was trained. Obviously the physician using such facilities in a rural area will not inspire confidence nor can he compete with the better facilities available in the city.

The Foundation selected one of the outstanding medical architects in the country to develop a functional, inexpensive, modern medical center (Figs. 1-3). It contains features not found in any other medical center in the country. The circular patient-flow pattern provides for better patient comfort, enables maximal efficiency of the physician's time, and provides for central control enabling one person to handle the duties of nurse, receptionist and laboratory technician.

Another feature of maximal importance to a physician is that all "group I" equipment such as instrument cases, filing cases, bookcases, storage areas, and lavatories are all built in and serve as nonweight-supporting wall sections. This "built-in" feature is found only in the Foundation plan.

But how does this guarantee that the people use the services of the physician? First, the facility is modern in every respect and is better than, or at least equal to, any they will find in neighboring towns. But the big reason is that the people—the entire community, not just two or three wealthy leaders—have invested in this building. They intend to pay interest on any indebtedness on the building. How can they pay interest, let alone recover their investment, unless they use the physician and the modern facility?

Only those communities that can support a physician should be encouraged to build modern medical facilities.

The Foundation has developed a way to determine a community's medical habits and ability to support a physician. This is done by means of a person-to-person survey. The Foundation developed the questionnaire, a local organization such as the Lion's Club, Kiwanis Club, Rotary Club or the Chamber of Commerce does the actual contact work, and then the forms are sent to the home office of the Foundation for statistical processing.

The survey findings work two ways. They tell the physician the medical need in the area and the townspeople the economic loss they are sustaining each year they are without a physician.

To the prospective physician they can give such information as:

1. The number of illnesses in the area during the last twelve months.

2. How many of these needed physician care; how many office calls; where did the patients go; how far did they have to travel; and approximately how much did they pay for professional care.

3. How many were hospitalized; in what hospital; how far away and for what.

4. What per cent of the population carries hospital insurance, health insurance.

5. Approximately how much income could the physician expect the first year.

The Foundation is now ready to present these facts to the community. This is done at a town meeting. A representative from the Foundation explains the findings of the survey. He presents

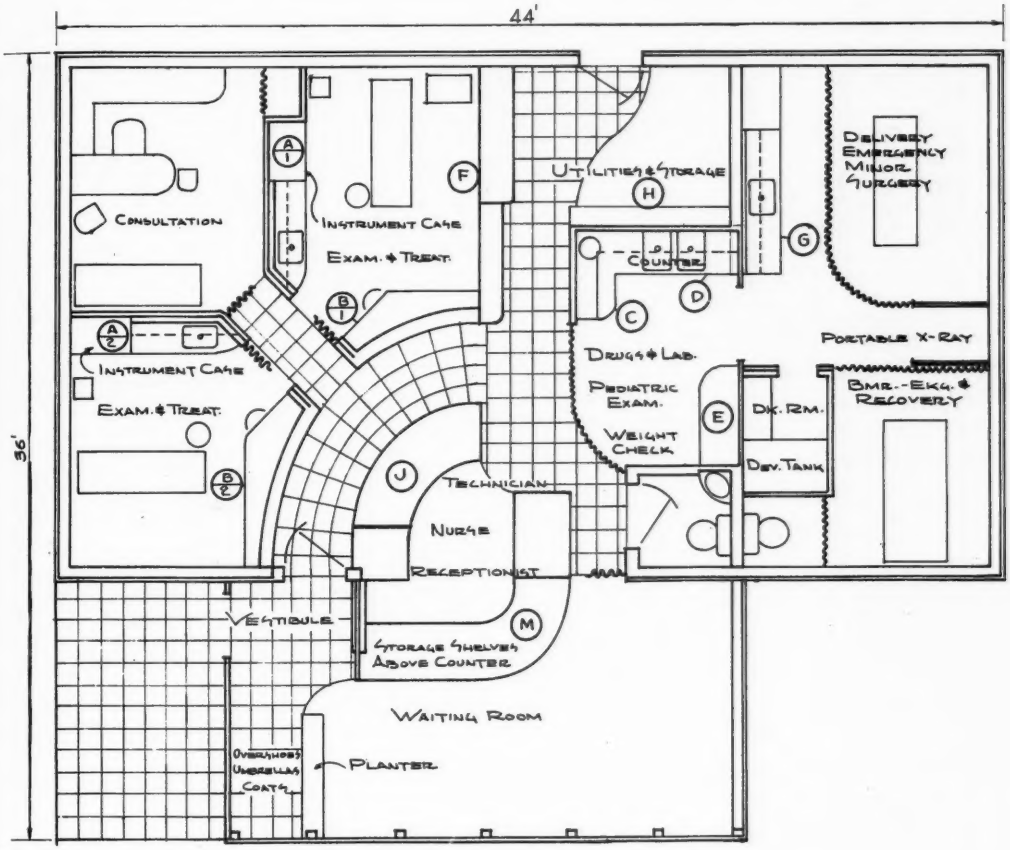


Fig. 2. One-physician plan.

To the community it gives, for example, in Hull, Iowa—a trade area of approximately 5,000 population—the following information:

1. The people of this area are averaging a collective 966 miles per day just going to and returning from their physicians in the surrounding cities.

2. These people are spending at least $33,216 in physicians' office calls alone, $26,500 for medicines purchased in these other towns, and $3,800 for gas and oil alone in going to the physician, making a total annual sum of $63,516.

3. These people also purchase, at the time of visiting the physicians, items that could just as well be purchased in Hull, Iowa; this is estimated to be more than $44,000 additional.

the plans of the building the Foundation has developed and explains that the Foundation will furnish free of charge all necessary plans and working specifications. The community must raise the money and build the facility. The Foundation will also help them in planning their campaign for fund raising, and help them organize a trusteeship or nonprofit corporation to own the building, manage it, and rent it to the physician; the state medical society and the placement agency of the American Medical Association will assist the community in getting the physician; and after the physician arrives the Foundation will send an expert on the business side of medicine to help him get started right.

A vote to go ahead starts the ball rolling.

The most surprising thing in the whole program is the short time it usually takes the community to raise the money. One community found it so easy that as soon as the money for the "Medical Center" was raised they started another drive to raise $40,000 for a community-center building.

The unique thing about the plan is that the Foundation gives only "know-how" and no money. The basic principle guiding the Foundation in this as in other programs is: "Help others to help themselves." The Community Medical Assistance Program is just one of many, but is the only project in the medical field.

This program is fairly new, having been started last February. By November it had twenty-two communities across the country co-operating. Some of these have their building finished and the physician practicing, while others are in either the building or the fund-raising stage. The major limitation is the availability of physicians. As the program becomes better known, even this problem should be solved.

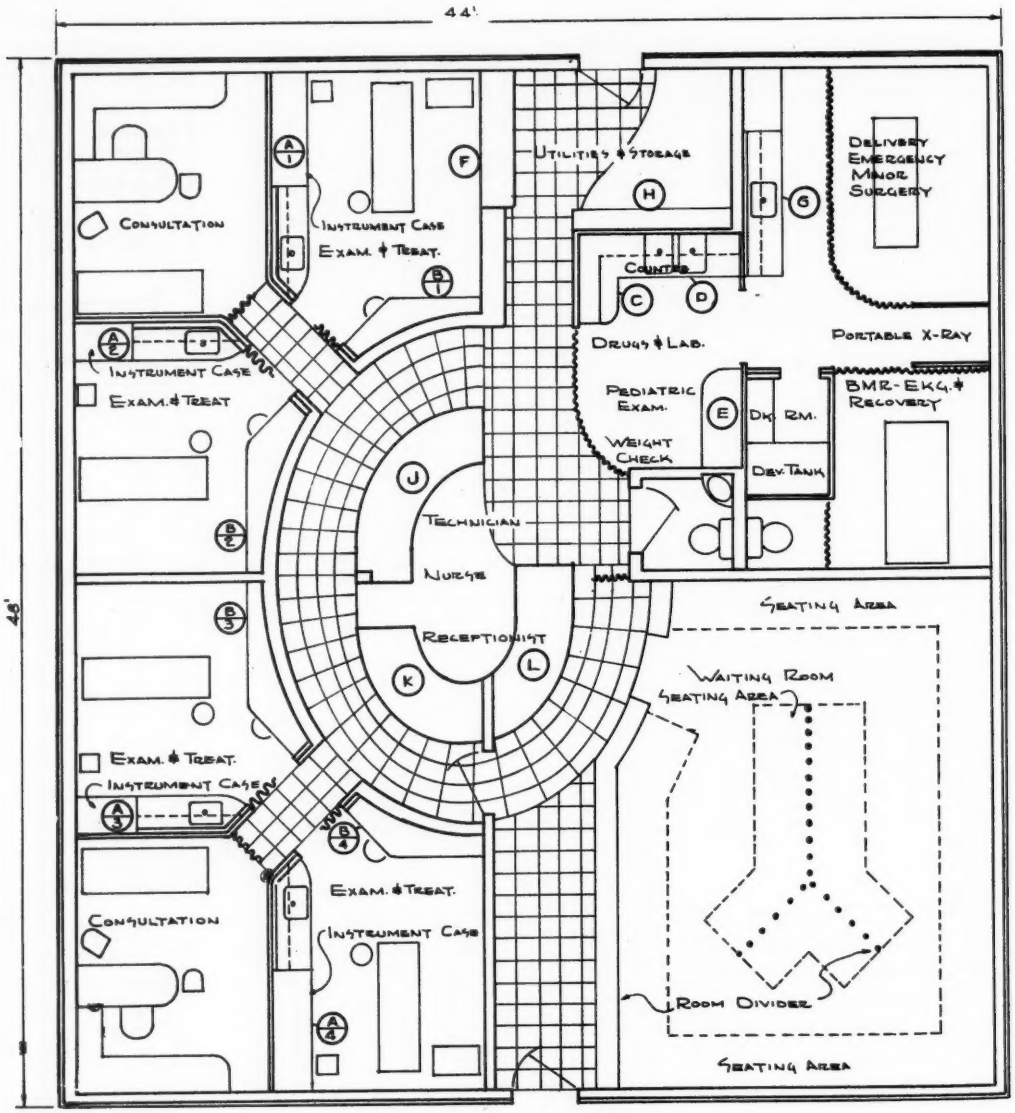


Fig. 3. Two-physician plan.

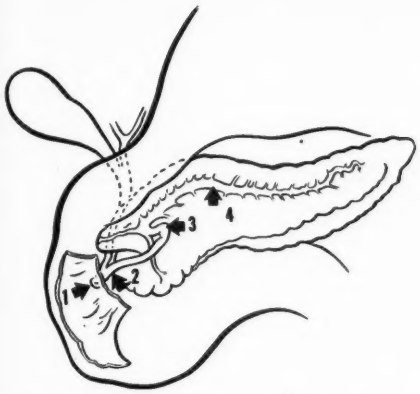


Fig. 1. The sites of pancreatic duct obstruction in chronic pancreatitis.

Surgery of the Pancreatic Ducts

ALAN P. THAL, M.D., Ph.D.
Minneapolis, Minnesota

SINCE the first cannulation of the pancreatic duct by Reynier de Graaf in 1662 surgeons have been dilatory in their approach to this gland. The catastrophic sequelae of meddlesome surgery in this area cannot fail to impress. Over the past twenty years surgical techniques have advanced considerably and major procedures are now commonly undertaken on the pancreas with a low mortality rate. The present communication deals with direct surgical approaches now being utilized in the treatment of chronic pancreatitis.

Necropsy and operative studies have shown that chronic pancreatitis is often the result of pancreatic duct obstruction.[1] The promising results which have followed successful decompression of the pancreatic ducts tend to support this finding.

The Sites of Pancreatic Duct Obstruction.—The etiology of noncalculous obstruction to the pancreatic duct is far from clear. Periductal fibrosis, squamous metaplasia and obstruction by inspissated secretions appear to be important.

The site of the obstruction may vary considerably as shown in Figure 1. Obstruction at the duodenal level may be due to papillary spasm or fibrosis. It is now also apparent that the pancreatic duct orifice may participate separately in this narrowing process. In such cases section of the common ampullary sphincter, alone, does not provide drainage of the pancreatic duct. In treating chronic pancreatitis surgically it is often necessary to enlarge the pancreatic duct orifice separately.

In the more advanced case of chronic pancreatitis the common site of stricture is in the head or body area of the gland. In the advanced case, obstruction may be multiple and even involve microscopic ductules making operation on the main pancreatic ducts futile.

Examination of the Pancreas at Operation.—Superficial palpation of the pancreas is unrewarding and often results in error. This is in part due to fat accumulation in and around the abnormally inflamed pancreas masking the underlying disease. The head of the gland can only be carefully examined after division of the lateral ligament of the duodenum and mobilization of the transverse mesocolon. The body is best inspected through an incision in the anterior wall of gastro-hepatic omentum and the tail is best approached through the gastro-colic omentum.

From the Department of Surgery, University of Minnesota, Minneapolis, Minnesota.
Inaugural thesis presented before the Minneapolis Surgical Society, March 6, 1958.

Localization of the Site of Duct Obstruction.—The approach to the origin of Wirsung's duct is made through the ampulla of Vater. When there are no indications for common duct exploration the papilla of Vater is identified after cholecystectomy by passing a ureteral catheter through the cystic duct into the duodenum. A 2 cm. longitudinal incision is made in the duodenum over the papilla and by means of stay sutures the papilla is extruded through the duodenotomy. Sphincterotomy is then performed simply to expose the pancreatic duct orifice. Figure 2 demonstrates the various positions of this orifice. It should be emphasized that cholecystectomy should always accompany sphincterotomy to prevent the development of chronic cholecystitis.

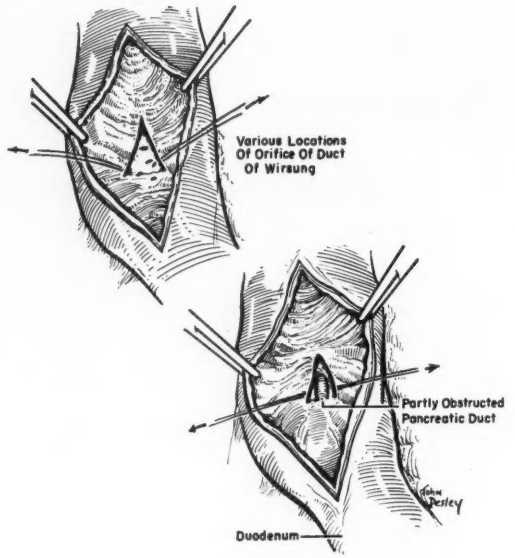


Fig. 2. Various locations of the main pancreatic duct orifice as seen at spincterotomy. In the lower illustration the pancreatic duct, obstructed at its orifice is seen bulging through the posterior wall of the ampulla.

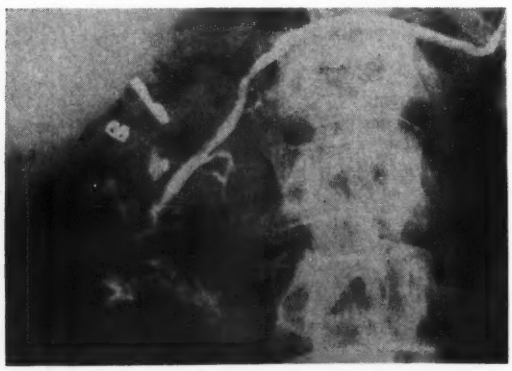


Fig. 4. Pancreatogram of a slightly dilated pancreatic duct. In this case the obstruction was brought about by fibrosis of the pancreatic duct orifice in the ampulla. This patient responded nicely to separate sphincterotomy of the pancreatic duct.

Where the pancreatic duct is chronically obstructed in the head of the gland the dilated duct assumes a superficial position on the anterior surface of the body of the pancreas behind the antrum of the stomach and may be palpated readily (Fig. 3).

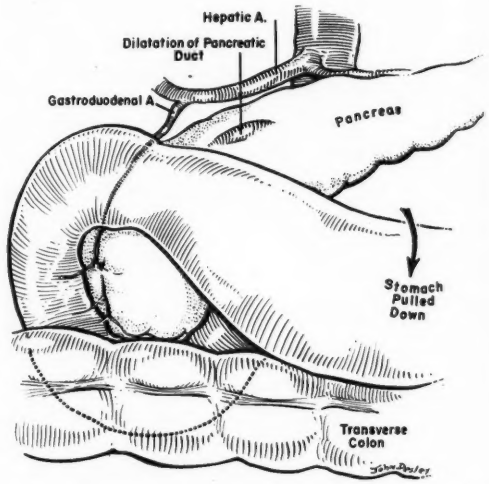


Fig. 3. The anatomic position at which the chronically obstructed pancreatic duct becomes palpable.

For retrograde decompression the duct may be identified easily after distal pancreatectomy.

Pancreatography.—This technique may be extremely useful in localizing the site of obstruction. Initial cholangiogram may reveal obstruction at the papilla. Direct pancreatography is indicated when gentle probing of the pancreatic duct reveals an obstruction. A fine polyethylene ureteral catheter (#3 or #4 French) is gently introduced into the pancreatic duct. Where obstruction is incomplete the catheter will often traverse the main duct throughout its length. Renografin 38 per cent is then allowed to gravitate through the tube. The small size of the catheter allows reflux back into the duodenum and prevents undue pressure elevation. X-ray will demonstrate the dilated distal pancreatic duct. With increasing experience in this

area pancreatography may be dispensed with in the majority of cases. The catheter may also be of value in sampling pancreatic juice beyond the site of obstruction. Juice taken from an obstructed duct is often frankly purulent.

The Operative Approach to the Problem of Pancreatic Duct Obstruction.—The type of procedure performed will of necessity depend on the site of obstruction.

1. Obstruction at the ampulla of Vater. The

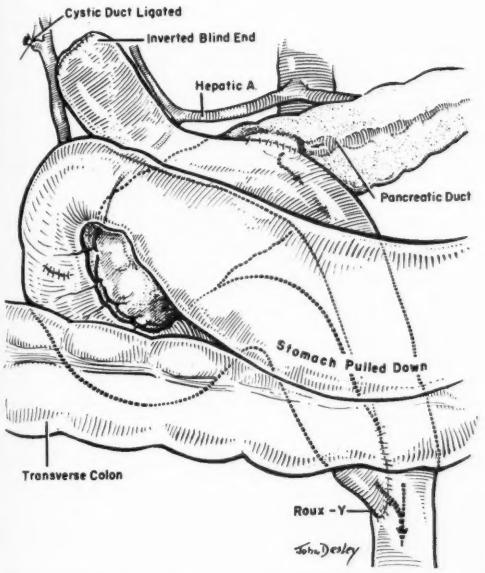


Fig. 5. Side-to-side pancreato-jejunostomy. There is no sacrifice of pancreatic tissue in this procedure.

pancreatic and bile ducts may be separately or commonly involved by spasm or fibrosis at the papillary level. In the former instance the pancreatic duct sphincter must be separately divided after papillotomy. In the absence of intrapancreatic obstruction a soft metal probe will traverse Wirsung's duct into the tail of the gland with ease. It is mandatory that the pancreatic duct orifice be located when sphincterotomy is performed for drainage of the pancreas.

A small calculus may be removed through this approach using otologic alligator forceps.

2. Stricture in the head or body of the pancreas. After an obstruction has been demonstrated at a distance from the duodenum the duodenotomy is closed and cystic duct ligated. With longstanding obstruction the dilated main pancreatic duct comes to lie quite superficially on the anterosuperior surface of the gland behind the antrum of the stomach. If this duct can be palpated readily we favor a side-to-side anastomosis of the dilated duct to a

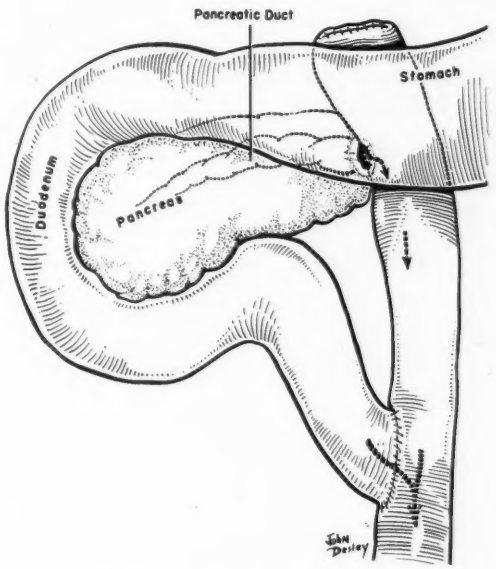


Fig. 6. Caudal pancreatectomy with pancreato-jejunostomy. The tail of the pancreas is resected to give access to the dilated duct.

Roux-Y loop of jejunum as illustrated in Figure 5. The advantage of this operation is that pancreatic islet tissue is preserved and a wide anastomosis can be made. When a dilated duct cannot be readily palpated we prefer distal pancreatectomy and Roux-Y drainage (Fig. 6) an operation originally proposed by Robert Coffey in 1909.[2]

3. Diffuse inflammatory disease of the head of the pancreas. In these cases there are often multiple strictures and many calculi in the head of the gland. Here the procedure of choice is partial pancreato-duodenectomy. The operation can now be performed with a low mortality rate and the results are excellent particularly when the islet and acinar tissue of the tail is not completely destroyed.

Techniques of Pancreatic Duct Anastomosis.—The cut surface of the pancreas should be handled with as much care as an opening in the bowel. All bleeders and ductules are carefully grasped with mosquito forceps and tied with fine silk. The main duct is then isolated and the cut surface of the

pancreas is then carefully inverted around the pancreatic duct. In general no tube is necessary for duct anastomosis which is made with interrupted arterial silk. A buttressing row of 5-0 silk is laid posteriorly and anteriorly to approximate the inverted surface of the pancreas to the serosa of the bowel. It is an experimentally proven fact that these anastomoses remain patent only when other avenues of drainage are partially or completely obstructed.[3]

TABLE I.
CHRONIC PANCREATITIS TREATED SURGICALLY
(36 Cases)

	Number	Good Results	Poor Results	Operative Mortality
Sphincterotomies	29	24	5	2 (7%)
Pancreato-duodenectomy	2	2		0
Retrograde drainage	4	4		0
Marsupialisation of pseudocyst	1	1		0
Negative exploration	2			0

Explorations revealing disease other than pancreatitis:
1 carcinoma third portion duodenum.
1 carcinoma head of pancreas.

Results of Surgical Treatment of Chronic Pancreatitis.—The results of the last thirty-six operations for chronic pancreatitis are summarized in Table I. From this table it will be seen that the majority of cases were approached by the ampullary route.[4] The remaining cases represented examples of more advanced disease where the obstruction lay in the head or body of the gland. Diagnosis is often a problem, and four cases, listed in this table, were misdiagnosed as chronic pancreatitis. Exploration in two of these cases revealed unsuspected neoplasms.

The results of decompressive surgery in chronic pancreatitis must be measured in several parameters. Early in the course of the disease therapy is aimed at the prevention of recurrent attacks of acute pancreatitis. At this stage the obstruction is often localized to the duodenal area and can be treated easily by sphincterotomy. In the majority of cases successful decompression prevents recurrence.

Late in the disease, therapy is aimed largely at treating pain, exocrine insufficiency and in preventing or retarding the development of diabetes. Where the duct can be adequately decompressed the results are most gratifying. In some cases of advanced disease the pancreas is a fibrocalcific mass containing multiple isolated abscess and decompressive operations are without value. Early treatment is important in this disease and decompression of an obstructed duct protects both acinar and islet tissue. Nevertheless, even in advanced disease, partial return of exocrine activity may follow a drainage procedure.

Discussion

When obstruction due to stone or stricture occurs within the head of the pancreas, the pancreatic juice in the obstructed duct is frequently grossly purulent and yields coliforms, streptococci or staphylococci on culture. Repeated bouts of pancreatitis are of grave portent both in regard to exocrine and endocrine function. Indeed, the latter deficit as shown by an abnormal glucose tolerance test, may long precede any demonstrable exocrine deficiency. Surprisingly, far-advanced chronic pancreatitis may exist in patients showing little or no digestive defect. Steatorrhea is a very late sign of advanced disease. When clear-cut ductal obstruction is relieved there is good evidence of regeneration of acinar tissue even after long-standing obstruction.

Decompressive surgery of the pancreatic ducts has great merit in the treatment of chronic pancreatitis and should certainly be preferred over indirect procedures such as sympathectomy, partial gastrectomy or transplantation of the bile duct. Precise identification of the point of obstruction and careful technique are the most important factors influencing a successful outcome.

As a group, the chronic pancreatitis patients are difficult to manage. Often they are discouraged by the results of previous surgery, many are addicted to opiates or alcohol, some have frank diabetes, anemia or malnutrition. They are pain-racked and depressed. These problems only serve to heighten the dramatic effect of successful surgery.

References

1. Thal, A. P., Goott, B., and Margulis, A. R.: The sites of pancreatic duct obstruction. To be published.
2. Coffey, R.: Pancreato-enterostomy and pancreatectomy. Ann. Surg., 50:1238-1264, 1909.
3. Bonta, J. A.: An experimental study of retrograde pancreato-jejunostomy. Surgical Forum, V:408-414, 1954.
4. Doubilet, H., and Mulholland, J. H.: Eight year study of pancreatitic and sphincterotomy. J.A.M.A., 160:521-528, 1956.

LARGE GASTRIC LESIONS

TWO CASE REPORTS

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Gastric cancer and gastric ulcer continually present critical differential problems in diagnosis. It has long been realized that as the size of a gastric lesion increases, the percentage of benignancy decreases. In a study of 759 cases of gastric ulcer Comfort and associates[1] found that only 2 per cent of the ulcers had a diameter of more than 7 cm. By contrast, in a group of 924 cases of gastric cancer, 42 per cent of the lesions were 7 cm. or greater in diameter. This figure of only 42 per cent of lesions more than 7 cm. in diameter presents an interesting angle concerning gastric lesions, in that it reflects the attitude of the Mayo Clinic staff of considering these lesions as surgical problems. In our opinion a gastric lesion is guilty until proved innocent, granting the exceptions that apply to any such categorical statement.

From the Section of Medicine, Mayo Clinic and Mayo Foundation, Rochester, Minnesota. The Mayo Foundation is part of the Graduate School of the University of Minnesota.

Read at the meeting of the Minnesota Society of Internal Medicine, Duluth, Minnesota, October 20, 1958.

Certainly all physicians agree that the earlier a gastric cancer is diagnosed and the patient is operated on, the better the chance of cure. However, a corollary of this commendable attitude is the occasional pronouncement that a large gastric lesion is malignant, when such is not so. So many hopeless situations are encountered among patients having gastric lesions that the salvaging of any patient is a source of much rejoicing for the patient and satisfaction for his physician. Two remarkable cases have recently come to my attention and are presented briefly forthwith.

Report of Cases

Case 1.—A man, aged sixty-three, came to the Mayo Clinic on March 6, 1958. In November, 1957, he had begun to have severe sharp pain in the epigastrium. This pain would occur three or four days per week and came on several times a day, usually thirty to sixty minutes after meals, and might last as long as thirty minutes. The patient had thought that the pain was worse if he ate meat and so-called heavy foods. Vomiting afforded relief, and he had begun to induce it. Likewise, a bowel movement seemed to relieve the pain. Milk and alkalies



Fig. 1. Case 1.

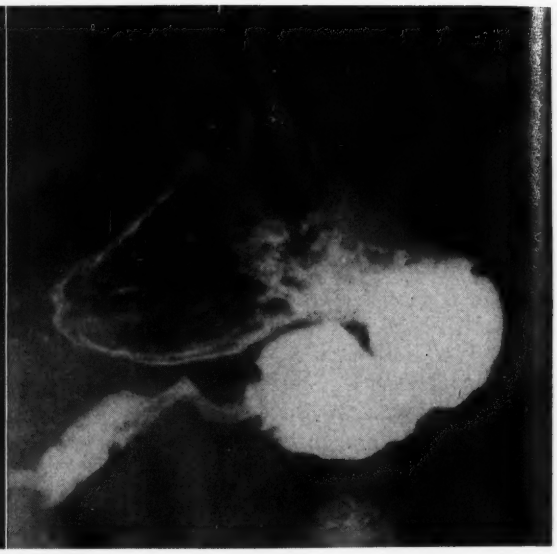


Fig. 2. Case 2.

did not afford relief. The pain radiated to the lower portion of the abdomen and also through to the back; this latter pain had awakened him at night.

He further stated that he had undergone operation on December 4, 1957, because preceding x-ray studies of the stomach had revealed definite pyloric obstruction. At operation the surgeon reported finding a large carcinoma of the pylorus with a mass which was so large and extensive that resection was not feasible. A third of the stomach was involved with a lesion which had eroded through the serosa and had extended posteriorly and involved the retroperitoneal lymph nodes. Hence, the abdomen was closed after exploration. No tissue was removed for histologic study.

After operation the patient's condition remained static. The epigastric distress persisted. His appetite was poor, and yet he did not have as much discomfort as might be expected in three months' time. Some members of his family urged that further opinion be obtained; others felt the situation was hopeless.

On the patient's arrival at the clinic, about three months after operation, his weight was 107 pounds compared to 145 pounds the previous fall. He was pale, weak and emaciated. An indefinite fullness could be felt in the upper part of the abdomen, but there was no definite hard mass or any enlargement of the liver. The pertinent laboratory studies disclosed a hemoglobin of 11.6 gm.; erythrocytes numbered 4,900,000 and leukocytes 12,700 per cubic millimeter of blood. The sedimentation rate of the erythrocytes was 44 mm. for the hour. The result of the bromsulphalein dye-retention test was zero. X-ray studies of the thorax did not show evidence of any abnormality. X-ray studies of the stomach were reported to show evidence of a large ulcerating carcinoma involving the lower half of the stomach (Fig. 1).

The patient was determined to have further operation if the surgeon was willing. This was agreed upon. Operation disclosed the presence of a large ulcerating lesion on the lesser curvature and posterior wall of the stomach just above the pylorus. This lesion had penetrated through and into the left lobe of the liver, superiorly and posteriorly, as well as into the body of the pancreas. No nodules were felt in the liver. Numerous specimens for biopsy were taken from various sites, but malignant cells were not found. Therefore, subtotal gastric resection was carried out with removal of the lower two thirds of the stomach and wide excision around the ulcerating lesion. The anastomosis was accomplished as an anterior Hofmeister-Polya modification. The patient's postoperative course was satisfactory. During the operation he received two pints of blood; the usual fluids and electrolytes were given until oral feedings were begun. The temperature did not rise above 100° F. or the pulse above 90. Drainage from the wound had practically ceased when he left for home.

The patient was dismissed from the hospital on the tenth postoperative day, and he left for his home ten days later. The pathologic study of the resected specimen confirmed the benign lesion, which was primarily an ulcer which measured 8.5 cm. in diameter. The lesion was located on the posterior wall and lesser curvature of the stomach. The ulcer base involved the pancreas and the liver. Several lymph nodes showed inflammatory reaction. This reaffirmed the absence of any carcinoma.

Case 2.—A man came to the Mayo Clinic on April 3, 1958, after a phone call from his physician requesting an emergency appointment, because it was the opinion of the consultants that the patient had a scirrhous carcinoma of the stomach of doubtful operability. The pa-

tient's symptoms were vague discomfort and fullness in the epigastrium. He had been able to eat about as usual. He had not suffered from nausea or vomiting, and his bowel movements were normal. Because of the gastric distress and indigestion, x-ray studies had been made of his stomach the preceding October and also in January, 1958, but the results were negative. However, x-ray studies done in April, 1958, at home, showed a filling lesion which was reported by the radiologist to be a scirrhous carcinoma of the stomach. The patient was placed on an ulcer diet for four weeks because of these symptoms. He then decided to come to the clinic for another opinion and to see if an operation would offer him any hope.

He stated that his normal weight was around 175 pounds, but his weight had increased to 186 pounds, probably owing to the midmeal feedings for the ulcer regimen. Physical examination did not show any significant abnormality. The x-ray films which he brought with him were interpreted by radiologists at the clinic as showing a filling constriction in the midportion and proximal end of the stomach. The x-ray of the thorax gave negative results. The hemoglobin and blood counts were normal. Gastric analysis revealed total acids of 42 units and free hydrochloric acid of 28 units.

Our x-ray examination showed evidence of an infiltrating carcinoma in the body of the stomach extending from about the level of the esophagogastric junction down to near the angle of the stomach (Fig. 2).

In view of x-ray studies at the clinic and the x-ray films the patient brought from home, the question was posed as to whether or not the lesion was operable. In such cases our policy has been to explore a lesion if other conditions permitted; therefore the patient was seen in surgical consultation and exploration was carried out on May 2, 1958. On first opening the abdomen nothing of significance could be seen. Two or three loops of small bowel were adherent to a right upper rectus incision, which was the site of a prior cholecystectomy. The stomach was then easily exposed and, in spite of most careful palpation, no lesion was detected within it. The glands in the region were not enlarged. The greater omentum was reflected off the transverse colon, but no disease process could be found. The surgeon finally decided to open the stomach to be sure that there was no such condition as carcinoma en nappe, which might account for the curious x-ray distortion in the absence of a palpable lesion. Absolutely nothing was found, and the abdomen was closed after exploration. A specimen from the stomach was removed, and it was entirely normal.

Comment

In a sense, these two patients presented comparable preoperative situations, namely, extensive lesions of the stomach. In Case 1 exploration elsewhere had confirmed the preoperative opinion of an extensive carcinoma. In Case 2, however, on exploration at the clinic no lesion was demonstrated. This case represents one of the exceedingly rare instances in which evidence of a nonexisting gastric deformity is apparent on the roentgenogram. Case 1 illustrates the rule that a positive diagnosis of cancer with our present knowledge must be based on accurate pathologic study. This is a recurring lesson that applies to all of us. Both cases illustrate the wisdom and fairness of surgical exploration, even though all preoperative signs are unfavorable. I have no explanation for the amazing and weird roentgenologic findings in Case 2. Yet if we had failed to heed the findings which were reported by radiologists both at the patient's home and at the clinic, the unproved diagnosis of cancer which did not exist would have remained. It is from such cases as these that cancer cures are obtained by quacks who prey on sorrow and fear.

Such medical reports are obtained and offered by the charlatan as proof that cancer did exist, and yet we, ourselves, are guilty if we have not pursued our study to its limits. Many well-documented instances are available of charlatans who have produced medical reports or photostatic copies of records in which a positive diagnosis of cancer has been made, and yet actually it was never proved.

The basic studies of cell structure originally carried out by Dr. William C. MacCarty, emeritus member of the Mayo Clinic staff, have led the way to advanced study and correct diagnosis of cancer. In a sense, all cytologic studies, which are now attracting so much attention, have their roots in his work.

Cases such as the two that I have reported emphasize vividly what Dr. MacCarty has taught over many years. The diagnosis of cancer must be made by the trained pathologist as he studies the cell. Both of these cases are offered not in any sense of criticism, but to increase our awareness of the differential problems in the diagnosis of gastric cancer and gastric ulcer and of the necessity of proving benignancy or malignancy of such lesions. Thereby we can help to avoid the inroads of state medicine and the claims of cures made by charlatans.

Reference

1. Comfort, M. W., Priestley, J. T., Dockerty, M. B., Weber, H. M., Gage, R. P., Solis, Jorge, and Epperson, D. P.: The small benign and malignant gastric lesion. Surg., Gynec. & Obst., 105:435-448 (Oct.) 1957.

Hemangioma of the Ileum

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Presented at the meeting of the Minnesota Surgical Society, Rochester, Minnesota, May 9, 1958.

IN the great majority of cases, hemorrhage from the gastrointestinal tract originates in lesions of the esophagus, stomach or duodenum. In a smaller number of instances, leiomyomas, carcinomas and carcinoids of the small bowel, and Meckel's diverticula, are sources of gastrointestinal hemorrhage. One of the most unusual causes of bleeding from the gastrointestinal tract is hemangioma of the small bowel.

In 100 consecutive cases of gastrointestinal hemorrhage reported by Osborne and Dunphy,[1] ninety-nine were peptic or esophageal in origin; one was caused by a small bowel aneurysm. In a study of 673 cases of gastrointestinal hemorrhage at the Cook County Hospital, hemangioma was not mentioned. Shepherd[2] stated that prior to 1953 only two cases of hemangioma of the gastrointestinal tract had been recorded in the *British Journal of Surgery*. He reported a case of recurrent, severe hemorrhage from the intestine of a patient, aged twenty-two, with hemangioma of the ileum.

A hemangioma is a vascular lesion, congenital in origin, consisting of endothelium-lined spaces packed together and varying in size and shape. It is bluish or purplish in color, and soft and spongy. Blood can be squeezed from the cut or ulcerated surface. Gentry, Docherty and Clagett[3] have given the following classification of vascular lesions of the gastrointestinal tract:

A. Telangiectasis (hereditary and non-hereditary types)
B. Hemangioma
1. Capillary hemangioma (simplex, mostly single)
2. Mixed capillary and cavernous hemangioma
3. Cavernous hemangioma.
   a. Multiple phlebectasis (small cavernous)
   b. Simple polypoid (single cavernous)
   c. Diffuse expansive (single contiguous)
   d. Diffuse expansive (multiple non-contigous)

In the series of benign tumors of the small bowel reported by Olson, Docherty and Gray,[4] hemangioma was the rarest. Only four of seventy-seven tumors were hemangiomas; only two of these four produced symptoms. From one there was bleeding, and the other produced obstruction.

Raiford[5] reported eighty-eight cases of tumors of the small intestine collected from 11,500 autopsies and 45,000 surgical specimens. There were three hemangiomas. In a review of 1,400,000 case records, Gentry, Docherty and Clagett[3] found 106 vascular lesions of the gastrointestinal tract, forty-six of which were observed at the time of surgical treatment.

Rarely is the diagnosis of hemangioma of the intestinal tract made preoperatively. Hemorrhage and obstructive symptoms are the most common manifestations. Madell[6] has emphasized the diagnostic value of unusual localized clusters of phleboliths in the abdomen as a sign of unsuspected hemangioma of the ileum and mesentery. Goldfarb, Gould and Eickner[7] have reported the case of a white man, aged thirty-two, who, after many hospital admissions because of anemia and weakness over a period of ten years, was found by x-ray examination to have a polypoid alteration of the mucosal pattern in a short segment of the proximal ileum. At operation an angiomatous mass was found.

The following case report illustrates some of the interesting features of this unusual lesion.

Case Report

A white man, aged fifty, was admitted to the hospital on August 11, 1957 at 10:15 p.m. During the morning he had noticed some blood in his stool. Throughout the day he continued to bleed from the bowel, had five or more stools, and the blood was both dark and bright. He became "weak and wobbly," his heart beat rapidly and he became faint. He did not vomit.

On examination, the patient was found to be very obese. He was alert, cooperative, and pale. The pulse rate was 92 per minute. The blood pressure was 82/46 mm. of mercury. The abdomen was rounded, symmetrical and there was a McBurney's incision scar. There was slight tenderness in the epigastrium. Rectal examination was negative except for the presence of tarry stool.

The results of laboratory examination were as follows: Hgb. 9.45 gm./100 cc., hematocrit 28 per cent, leukocytes 11,450 per cu. mm. Urinalysis was negative except for the presence of an occasional hyaline cast. X-ray of the chest was negative.

This patient had been under our observation for many years. He was known to have a duodenal ulcer

for which he had been treated medically. As recently as February 29, 1956, the roentgenologist reported, "Duodenal ulcer with crater and marked deformity of the duodenal bulb."

It was assumed that the gastrointestinal hemorrhage originated in the duodenal ulcer. Medical treatment was instituted and the patient was given a transfusion of 500 cc. of blood.

On August 13, the patient felt good, his pulse rate was slow, the hemoglobin was 9.15 gm./100 cc. and the hematocrit 24 per cent.

At 4 p.m. on August 14, the patient became faint, weak and nauseated but he did not vomit. He was found to be in mild shock with a hemoglobin of 7.1 gm. and hematocrit of 20 per cent. On this day and the following day, 3,000 cc. of blood were administered. The pulse rate remained between 120 and 130 per minute and the blood pressure varied from 98/54 to 120/80 mm. of mercury. The hemoglobin dropped to 6.85 gm. and the hematocrit to 20 per cent. At 3 P.M. on August 15, the patient was taken to the operating room.

Under general anesthesia an upper midline incision was made. On inspection of the duodenum no evidence of recent activity was found and the scarring was not as great as anticipated. There was no blood in the stomach or in the upper reaches of the small intestine. There was a great deal of blood in the colon and in the lower segments of the small bowel, however. There was no Meckel's diverticulum. An examination of the small bowel was begun and in about the middle of the ileum there was an area in which the blood vessels beneath the serosa were dilated and there was slight thickening of the bowel wall. This segment of ileum was resected and continuity was re-established by end-to-end anastomosis. The wound was closed anatomically. During the procedure, a transfusion of 500 cc. of blood was continued, bringing the total amount of blood received to 4000 cc.

Convalescence was essentially uneventful. The patient was dismissed from the hospital on August 23 with a hemoglobin of 11.3 gm. and a hematocrit of 35 per cent. He has remained well.

The pathologist, Dr. E. C. Menefee, gave the following report: The specimen consists of 8 cm. of ileum. Along the mesenteric edge there is a loose network of greatly enlarged blood vessels extending up the wall of the bowel over an area measuring 2 x 1.5 cm. There is some irregular thickening in the bowel wall palpable from the outside. There are two submucosal nodules, one 0.5 cm. in diameter and the other measures 1 x 1.5 cm. These are visualized through the mucosa as dark purplish areas. On the surface of the larger mass there is a small defect in the mucosa through which old blood oozes. When these lesions are cut across they appear to be submucosal hematomas. Microscopically, the enlarged vessels are seen to have a capillary structure consisting only of endothelial cells and a small amount of loose connective tissue about them. The submucosal nodules are hematomas. The remainder of the bowel appears essentially normal.

Diagnosis.—Subserosal capillary hemangioma and submucosal hemorrhages with one area of mucosal ulceration.

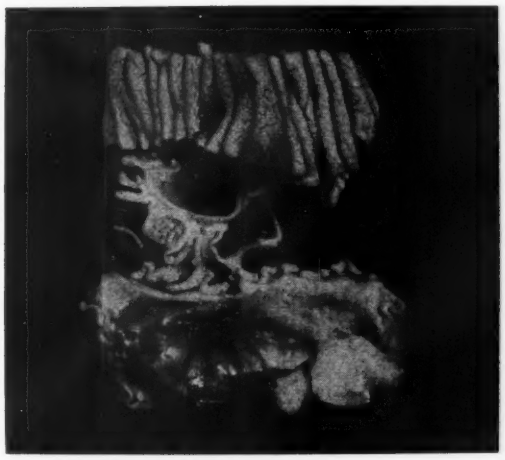


Fig. 1. Segment of ileum, 8 centimeters in length, containing submucosal hemangiomas.

Summary

Hemangioma of the gastrointestinal tract is a rare lesion. Hemorrhage and obstruction are the most common symptoms. Preoperative diagnosis is difficult but not impossible in some cases in which a cluster of phleboliths can be demonstrated by x-ray. A case is reported in which a massive gastrointestinal hemorrhage in a patient with a known ulcer was thought to be peptic in origin but proved to be from a capillary hemangioma of the ileum. Resection of the lesion was followed by complete recovery.

References

1. Osborne, M. P., and Dunphy, J. E.: Identification of Cause of Obscure Massive Upper Gastrointestinal Hemorrhage during Operation. A.M.A. Archiv. of Surg., 75(6):964-971, Dec., 1957.
2. Shepherd, J. A.: Angiomatous Conditions of the Gastrointestinal tract. Brit. J. Surg., 40:409, 1953.
3. Gentry, R. W., Docherty, M. B., and Clagett, O. T.: Collective Review: Vascular Malformations and Vascular Tumors of Gastrointestinal tract, Int. Obstr. Surg., 88:281-323, 1949: in Surg., Gynec. & Obst.
4. Olson, J. D., Docherty, M. D., and Gray, H. K.: Benign Tumors of the Small Bowel. Am. Surg., 134:195, 1951
5. Raiford, T. S.: Tumors of the Small Intestine. Arch. Surg., 25:125, July, 1932.
6. Madell, S. H.: A case of hemangioma (angiomatosis) of the small intestine and mesentery; a radiographic clue to diagnosis. Radiology, 69(4):564-6, (Oct.) 1957.
7. Goldfarb, J., Gould, J. M., and Eichner, G. S.: Hemangioma of the small intestine causing anemia of ten years' duration. J. Am. M. Ass'n., 156(7): 705-7, Oct. 16, 1954.

Delivery by Cesarean Section After Strassmann's Operation for a Bicornuate Uterus

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THE obstetrical significance of a bicornuate uterus is often minimized. The deformed uterus, resulting from faulty midline fusion of the Müllerian ducts, has a poor gestational capacity. The result is a high incidence of abortion, prematurity and fetal loss.[1] Strassmann[2] with his unification operation wanted to help those women to become mothers.

Not every double uterus requires unification; about 30 per cent of women with a split uterus are fertile and carry to term, but various complications like premature labor, postpartum hemorrhage, prolapsed cord and retained placenta may occur and should be anticipated. The main indication for the Strassmann's operation is habitual abortion. Two abortions are enough to justify the operation.[2] When a patient presents herself with the history of habitual abortions at the third to the sixth month of pregnancy we have a strong suspicion of a malformation of the uterus. The following case report illustrates these criteria.

Case Report

Mrs. B. I., aged thirty-one, married for seven years, had been treated for infertility by specialists for six years. She presented problems of habitual abortions. She had one abortion after twenty-five weeks, one after fourteen and another abortion after fifteen weeks of pregnancy. The last two abortions happened within one year and each was followed by dilatation and curettage. Her double uterus had not been detected.

The patient consulted me on June 30, 1953, discouraged but still hopeful about having children. Physical examination gave essentially negative findings but the hystero-salpingogram revealed a uterus bicornis unicollis and patency of the tubes (Fig. 1).

Mrs. B. I. underwent surgery on October 4, 1953, with the performance of the Strassmann operation (Figs. 2-5). The uterine bodies were incised along the median ridges (Fig. 2). The cavities were opened all the way down into the common cervix and the septum removed (Fig. 3). The transverse incision was converted into an anterior-posterior suture line (Figs. 4-5). By this method the raw surfaces, which were created by excising the partition, were kept away from each other. This is the secret of the success. One layer of interrupted mattress sutures was used to close the incision. A single uterine cavity with normal reproductive space was obtained by this operation[2] revealed in the postoperative hystero-salpingogram (Fig. 6).

Our patient became pregnant about one year after surgery. Her pregnancy was undisturbed. The fetal head was not engaged at the term of pregnancy, the pelvic measurements were adequate. We expected complications in an elderly primipara. We preferred a delivery by a low cervical Cesarean section. A living healthy boy of seven pounds and three ounces was delivered. A careful examination of the uterine walls during the operation revealed that the placenta was adherent to the fundus and the fundus muscle was extremely thin. A previous Strassmann's operation is actually not an indication for a Cesarean section, but the implantation of the placenta in the scar area provides a condition of a possible uterine rupture.

Discussion

Strassmann's operation is relatively simple and is usually well tolerated. It is a constructive procedure which provides a physiologic union that nature forgot to complete. It should be noted that in a case where there is a double vagina and a double cervix, a vaginal approach to sever the septa between these organs has to precede the

Presented at the meeting of the Minnesota Obstetrical and Gynecological Society, Rochester, Minnesota, May 3, 1958.

abdominal operation. A waiting period of at least six months after surgery is recommended before the patient becomes pregnant.

would be a great fetal salvage[3] along with the rewards of parenthood for some otherwise infertile couples.

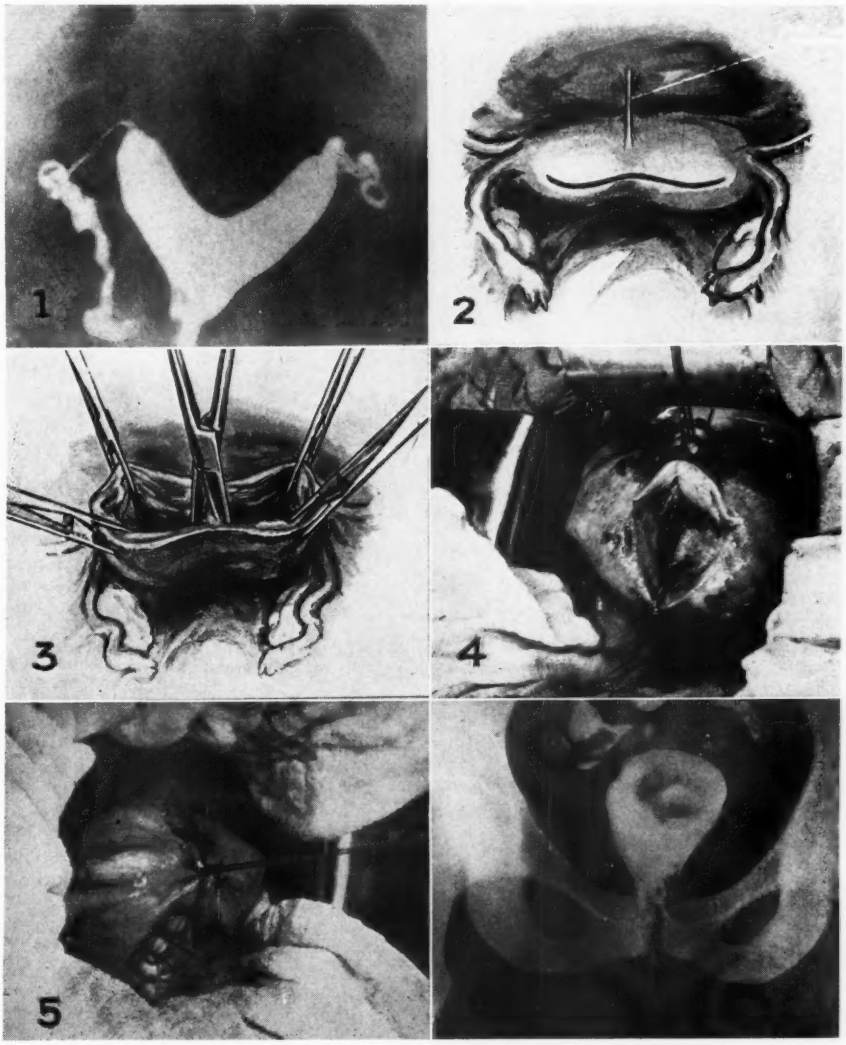


Fig. 1. Hystero-salpingogram revealing a uterus bicornis unicollis and patency of the tubes.
Fig. 2. Illustration of incision along the median ridges of the uterus.
Fig. 3. Illustrates the opening of cavity and removal of the septum.
Fig. 4. Transverse incision being converted into an anterior-posterior suture line.
Fig. 5. Conversion into anterior-posterior suture line.
Fig. 6. Hystero-salpingogram revealing a single uterine cavity with normal reproductive space.

The occurrence of uterine deformity is not rare and those physicians called upon to perform obstetric practice (both general practitioners and specialists) should be prepared to recognize such malformation early in their study of women who present a history of repeated abortions. The result

References

1. Jones, Walter S.: Obstetric significance of female genital anomalies. Obst. & Gynec., 10:113, 1957.
2. Strassmann, E. O.: The Strassmann operation for double uterus. Obst. & Gynec., 10:701, 1957.
3. Falls, Frederick H.: Pregnancy in the bicornuate uterus. Am. J. Obst. & Gynec., 72:1243, 1956.

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Fatal Bone Marrow Aplasia Associated with Celontin® Therapy

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ANTICONVULSANT drugs which are free of side effects have not yet been discovered. Although some are described as "risk" drugs in the sense that they produce more frequent and more serious side effects than others, nevertheless they should all be used with caution and invariably under strict supervision. Any deviation from such procedure on the part of patient or physician may lead to disaster.

The similarity of chemical structure of the commonly used anticonvulsants has been noted by Zimmerman[1] and the fact that toxic reactions may occur from any of them probably can be explained on the basis of this similarity of molecular composition (Fig. 1). It appears that the addition of methyl groups (example: Tridione®) or combinations of methyl and phenyl groups (Mesantoin®, Celontin®) * may increase the incidence of toxic reactions.

Among more recent drugs with anticonvulsant activity and greater margins of safety, the succinimides appear to be quite effective.[2] The two which have had widest clinical application are Milontin® (n-methyl-a-phenylsuccinimide),[1] and Celontin, (n-methyl-a, a-methylphenyl succinimide) which was first reported by Zimmerman and Burgemeister.[3] Milontin has been reported to have "relatively low toxicity."[3] Celontin has been reported to produce greater toxic side effects than Milontin, but the therapeutic advantage has been

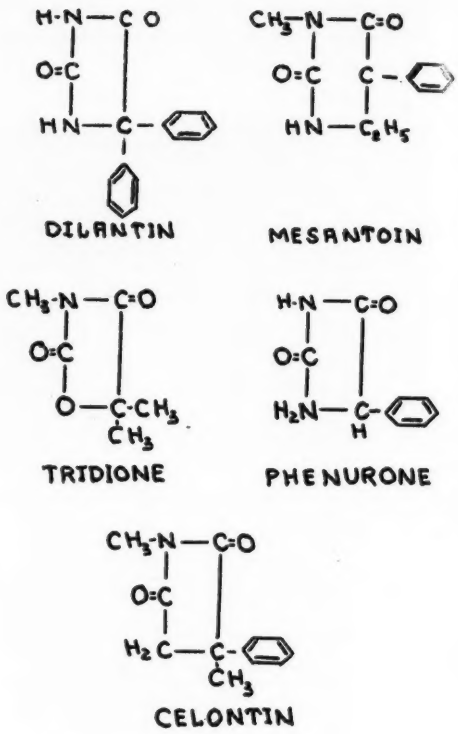


Fig. 1. Clinical structure of five commonly used anticonvulsants.

considered to outweigh this disadvantage. The incidence of toxic reactions to Celontin was 11 per cent in a series of 100 cases and of these there were no reported instances of blood dyscrasias.[4] To the writer's knowledge, no fatal reaction to this drug has been reported to date.

The following is a case in which death was considered to be due to bone marrow aplasia induced by Celontin.

Case Report

The patient, a thirty-five-year old, single woman, had a left radical mastectomy in December, 1954, for carcinoma. She was quite well until the early fall of 1956 when she developed an ataxic gait and slurring speech. A neurologist made a diagnosis of probable metastasis to the nervous system, particularly to the meninges in the region of the cerebellum, on the basis of widespread abnormalities on neurologic examination and the finding of an elevated spinal fluid protein. Bilateral oöphorectomy was done in January, 1957, but this failed to improve her status and the neurological symptoms became worse.

*Celontin® is a product of Parke, Davis & Co., Detroit, Michigan.

In May, 1957, she was examined elsewhere and it was the opinion then that the diagnosis of metastatic disease could not be substantiated but rather that she had a type of cerebellar ataxia of uncertain etiology (inflammatory, demyelinating, or degenerative).

Because of myoclonic jerking which had developed, she was started on Celontin in late May, 1957, in dosage of 600-900 mg. daily. Her myoclonia and speech both improved on this therapy. The dose was increased to 1200 mg. daily for a short period of time in June but the patient reduced it to the former dose because she thought she was too drowsy and "sick" to take more. Throughout this time she had endless complaints referrable to almost every system of the body, was constantly depressed, tearful and anxious. Other medications given for short periods for symptomatic relief were Donnatal®, Probanthine®, Premarin® and occasional doses of meprobamate.

On September 14, 1957 she was admitted to the hospital for observation and at this time the hemoglobin was found to be 2.5 gm. There was no evidence of blood loss. The white count was 4,200 with 59 per cent lymphocytes and 41 per cent neutrophiles. Marked thrombocytopenia was noted in the peripheral smear. Despite seven units of whole blood and large doses of prednisone, her hemoglobin rose by the fourth day to only 8 gm. and the white count had fallen to 800 with 64 per cent lymphocytes and 36 per cent neutrophiles. The platelet count was 16,000 on direct count and virtually none were seen on smear examination. At this time she began to show extensive hemorrhagic phenomena. Sections and smears of the bone marrow showed nearly complete hypoplasia, consisting almost entirely of lymphocytes, plasma cells and some tissue mast cells. Virtually no normoblasts or developing granulocytes were found.

On September 18, she had a grand mal convulsion, failed to regain consciousness and expired on the following day. Postmortem examination showed hemorrhages into the heart, lungs, abdominal viscera, kidneys and bladder. Extensive subarachnoid hemorrhage was present over the left temperoparietal area and diffuse petechial hemorrhages were found throughout the brain substance. No central nervous system or other metastases were found. Unfortunately the cerebellar pathology was not described.

Comment

It appears from this case that Celontin is capable of producing fatal marrow injury. It appears equally obvious that such an outcome might have been prevented had appropriate observations been made to detect early signs of bone marrow toxicity. Rather than to condemn the use of a valuable drug, this case report serves to emphasize the importance of being ever-mindful of the potential toxicity of such drugs and of making those observations which will detect toxicity at early and reversible stages.

References

1. Zimmerman, F. T.: New drugs in the treatment of petit mal epilepsy. Am. J. Psych., 109:767-773 (Apr. 1953).
2. Chen, G., Portman, R., Ensor, C. R. and Bratton, A. C., Jr.: The anti-convulsant activity of a-phenyl succinimides. J. Pharmacol. & Exper. Therap., 103:54-61 (Sept. 1951).
3. Zimmerman, F. T. and Burgemeister, B. B.: Use of n-methyl-a, a-methylphenylsuccinimide in treatment of petit mal epilepsy. A.M.A. Arch. Neurol. & Psychiat., 72:720-725 (Dec. 1954).
4. Zimmerman, F. T.: Evaluation of N-Methyl-a, a-Methylphenylsuccinimide in Treatment of Petit Mal Epilepsy, N. Y. St. J. Med., 56:1460-1465 (May 1956).

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SOME ASPECTS OF PSYCHIATRY IN THE NETHERLANDS

(Continued from page 99)

References

1. Lebensohn, Z. M.: Impressions of hospital psychiatry in Holland. Ment. Hosp., 7:22-26 (Oct.) 1956.
2. Guttersen, Alston G.: Trends in the design and construction of hospital facilities in Holland. Ment. Hosp., 7:27-32 (Oct.) 1956.
3. Querido, A.: Early diagnosis and treatment services. In: The elements of a community mental health program, Proceedings of a Round Table at the 1955 annual conference, pp. 158-181. Milbank Memorial Fund, 40 Wall Street, New York 5, New York.
4. Millar, W. M., and Henderson, J. G.: The health service in Amsterdam. Internat. J. of Soc. Psychiat., 2:141-150 (Autumn) 1956.
5. Verslag van de Dr. van der Hoeven Kliniek (annual report of the Dr. van der Hoeven Clinic). Overgenomen uit het Jaarverslag 1955 van de Willem Arntsz Stichting.
6. Ploegsma, W.: Personal communications.
7. Een eeuw krankzinnigenverpleging (A century of nursing care of the mentally ill). Gedenkboek ter gelegenheid van het honderdjarig bestaan van het Provinciaal Ziekenhuis naby Santpoort (voorheen Meerenberg) 1849-1949.
8. Verslag van de geneeskundige dienst van het Provinciaal Ziekenhuis naby Santpoort, 1956.

Editorials

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ARTHUR H. WELLS, M.D.
HENRY G. MOEHRING, M.D.

OUR AMA HOUSE OF DELEGATES AND MEDICAL POLITICIANS

If you are a "doubting Thomas" concerning the contributions to Medicine by the American Medical Association, you can afford one or two days of your professional life visiting selected reference committee hearings and at least a part of the session of the "House." To organize this study economically you should request by mail in advance of the meeting a list of the fifteen or more resolutions submitted by the various State Medical Societies for consideration by the House of Delegates. On the day or two prior to the reference committee meetings, you might seek out delegates of State Medical Associations submitting resolutions in which you are particularly interested. Here is a source of background information on deliberations of many physicians on county and state levels sometimes involving several states and frequently over an interval of years. On the proper day, budget your time to cover several of the reference committee hearings by checking the order of presentation of the various resolutions to which you are particularly attracted. If you wish time to mix an exposure to the advancements in medical science at the AMA meeting with your personalized introduction to the business and political side of medicine, choose the proper part of the House of Delegates meeting which you wish to attend on the following day.

Whether you are a research professor in one of the basic disciplines of medicine or a busy physician in the largest or smallest community in the state as a neophyte, you are in for a pleasing surprise and a lasting conviction. Although mistakes could be made even with such thorough discussions and democratic procedures the overwhelming chances are: first, that the medical care of the people will be improved or not altered by the final decisions of the House of Delegates and, second, that the physicians of the country have been properly represented. Any complaints to the contrary are most likely from physicians "too busy" to attend a "political" meeting or whose opinions are not in agreement with more than a small minority. Thirdly, you will realize beyond a doubt that the "politically" inclined physician is making every bit as important a contribution to the medical care of the future as the physician devoted to medical research with its alleged low financial returns or the busy and successful practitioner. In both of these groups, there are many who pride themselves on their strict attention to medical science and belittle the "self-seeking" intrests of the medical politician. Is there a little self-sanctioned dishonesty in all of us?

My hat is off to the productive, logical, honest, yes—often altruistic, medical politician who is also devoted to the best possible care of his patients. The chances are, in these days of two diametrically opposing political forces, that he will make a greater contribution to his fellow man than any of the rest of us physicians. He frequently makes a greater personal sacrifice in his efforts with a much smaller chance of gaining prestige and security than any of us.

While we are in a philosophical vein, let us not confuse the picture with theoretical values. The changes of our contributing materially or metaphysically after death are about five times less than that of a dead horse. Best we recall the saying of Emerson to the effect that men can be divided into two groups, the doers and those who sit back and criticize. Today, most of us can do more than provide security for ourselves through doing well by our patients, and our teaching or our research. If we have decided that our selected occupation in medicine requires our entire time and mental effort for a maximum contribution in this brief life, then let us at least boost the good medical politician.

PROPOSED CHANGES IN CONSIDERATION OF RESOLUTIONS BY THE HOUSE OF DELEGATES, MSMA

Through the years, the resolutions considered by the House of Delegates of the Minnesota State Medical Association have become more numerous and have assumed expanding implications. These changes reflect medicine's greater complexity and

its more numerous contacts with other facets of the society in which we live. Resolutions adopted by our House of Delegates reflect the opinion of that body and of the entire Minnesota State Medical Association. It is the responsibility of the House of Delegates, therefore, to be assured that each resolution receives sufficient consideration and thoughtful study for a sound decision concerning any action to be taken.

Heretofore, resolutions often have been received no earlier than the initial session of the House of Delegates. On occasion, a resolution has reached a committee only after it has adjourned. With this situation, it is remarkable indeed that the resolutions committees in recent years have acted with such wisdom.

Resolutions may contain only material of an essentially noncontroversial nature; under such circumstances, prompt consideration will be achieved despite a last-minute introduction. On other occasions, however, careful study may be necessary to probe all of the implications of a resolution. A committee may wish to schedule hearings so that additional information and the views of other interested parties may be sought. In the past, interested delegates have, at times, first been apprised of a resolution only as it has been presented by a committee for final action in the House of Delegates. Interested delegates unaware of a resolution often have additional pertinent information. Such delegates might wish to attend scheduled hearings. Above all, it is invariably the wish of the delegates to be adequately informed in order to vote wisely and to contribute generously to the discussion of any proposed action.

For the above reasons, the format of the annual session of the House of Delegates will be modified, if such changes meet with the approval of the delegates to the Minnesota State Medical Association. These changes will enhance the opportunity for delegates to study material under consideration but will not limit the right of any person, group or society to exercise its privilege of submitting resolutions for consideration by the entire House of Delegates. Such changes will make our procedure for considering resolutions similar to that followed by the House of Delegates of the American Medical Association.

It is requested that resolutions be submitted to the office of the Minnesota State Medical Association no later than 2 weeks prior to the opening session of the House of Delegates. This is the minimal time required for material to be duplicated and mailed to delegates with the assurance of its arrival in adequate time. Likewise, accompanying each resolution will be a statement as to the reference committee to which a resolution has been assigned. Such a statement will be helpful because reference committees customarily hold many of their deliberations prior to the opening session of the House of Delegates. At the opening session of the House of Delegates, each resolution already distributed will be read by title only, with mention being made of the committee charged with its consideration.

Resolutions that have been received too late for printing and distribution to the delegates will be read in their entirety at the opening session of the House. The committee to consider them will be assigned at the time of this reading.

Resolutions received late in the annual session of the House of Delegates still may be considered, provided time is sufficient for an adequate committee hearing of the resolution. The committee studying a resolution may recommend its adoption, its rejection, that no action be taken, or that action be deferred until the next meeting of the House of Delegates if, in the judgment of the committee, inadequate time exists for study of the measure.

It is hoped that the effectiveness of the House of Delegates may be enhanced by these proposed measures.

HADDON M. CARRYER, M.D.,
Speaker, House of Delegates, MSMA

THE VALUE OF STUDIES BY COMMITTEES OF THE MINNESOTA STATE MEDICAL ASSOCIATION

Members of the Minnesota State Medical Association generally do not appreciate the fact that numerous committees put in many hours of cooperative effort in worth-while studies. In the November issue of MINNESOTA MEDICINE, a report on cardiovascular disease in industry† presented some thought-provoking facts regarding policies of rehabilitation of cardiac patients. As industry represents an increasingly larger portion of the working population of our state, the policies that were reported on will assume greater importance.

†Mathy, W. E.: Survey of "cardiovascular disease in industry" in the state of Minnesota. Minnesota Med., 41:805-811 (Nov.) 1958.

This study was conducted by the Minnesota Department of Health, in conjunction with the Heart and Tuberculosis Rehabilitation Committee of the Minnesota State Medical Association. This report gives some insight into the methods used to assess certain aspects of the health of our populace. Recommendations in the published report for improvement of legal tools and social attitudes concerning the responsibility for the health and welfare of workers in industry are a result of this study. The medical profession should take a leading role in decisions regarding policies of rehabilitation. Only by the accumulation of facts can authoritative recommendations be given to those responsible for the employment of this important segment of the population.

This committee of our state medical society is to be commended for this interesting investigation. Their report should set an example for other committees for bringing information directly to the members of the state association. It is hoped that this and similar future reports will stimulate more Minnesota physicians to better citizenship through activities in the state medical association that serve the state as a whole.

R. Drew Miller, M.D.

ADRENOCORTICAL STEROIDS

Allergic manifestations are protean, ranging from the relatively minor discomforts or cosmetically objectionable skin conditions to life threatening anaphylactic shock and bronchial asthma. Many agents, such as the antihistamines, have found a well deserved place in the symptomatic control of minor allergic conditions, but it was not until the appearance of the adrenocortical steroids that all allergic conditions could be satisfactorily controlled.

All of the corticoids have been widely applied in allergic disorders, and the response to this form of therapy has been very gratifying. In many cases, the duration of treatment is so brief that physiologic hormonal side effects do not develop even with the short term use of the older steroids, cortisone and hydrocortisone. However, in certain cases, long-term therapy of allergies is necessary and side effects sooner or later develop. It may be of some interest to review briefly two papers on the management of allergic disorders with the newer corticoids. Grater (Antibiotic Medicine and Clinical Therapy, February, 1958) treated 115 cases of asthma, rhinitis, and dermatitis with methylprednisolone, of whom 107 had a favorable response. Side effects were limited to six patients and these were all of a very minor nature. He felt the potency of this corticoid was one and one-half times that of prednisolone.

Sherwood and Cook (*Journal of Allergy*, March, 1957) reported on the use of triamcinolone in a series of seventeen patients with asthma or rhinitis, and were able to observe a satisfactory clinical response, and established increased potency associated with a low incidence of side effects. Weight loss of a marked degree (10½ pounds) was, however, noted in one patient. This confirms the observations of Hellman and his associates (American Rheumatism Association meeting, Bethesda, November, 1956).

These studies serve to focus attention on the increased potency, high therapeutic effectiveness and low incidence of side effects seen with new corticoids.

The mechanism of action of the corticoids in quieting the allergic response is a very fascinating one and has been illustrated beautifully by DiRaimando and Forsham. Following the fixation of antigen and antibody to the cells, histamine-like substances are produced with resultant swelling of the cells and histamine-like effects on distant sites. The presence of excess amounts of hydrocortisone reduces the production of these histamine-like substances and thereby prevents changes both within the cell and also in the more distal structures.

The corticosteroids have enjoyed a wide and enthusiastic application in the field of ophthalmology, both topically and systemically. In general, the systemic use of these compounds has been limited to inflammatory diseases of the posterior segment, although certain workers have employed them for allergic conditions of the anterior segment which were refractory to topically applied steroids. The acute inflammatory lesions of the posterior segment respond rapidly, the chronic types demand more prolonged therapy often at higher dosage levels. Here again the newer corticoids, such as methylprednisolone, by virtue of their lower incidence of side effects offer definite advantages to the patient.

Systemic lupus erythematosus has become recognized over the past decade to be a much more common condition. The discovery of the L.E. cell and its diagnostic value in doubtful cases, fol-

This is the third of four editorials on steroid therapy.

lowed by evidence of the ability of corticotropin and cortisone to induce remissions has led to a greater interest in this disease. Systemic lupus erythematosus is characteristically a chronic disease, often subject to spontaneous remissions, but almost invariably fatal in its outcome. Despite the ultimate result much can be done to aid these patients. The use of adrenocortical steroids in systemic lupus erythematosus often results in a prompt improvement in the clinical picture, followed at length by an improvement in laboratory findings. The dosage of corticoids necessary to produce this picture of a clinical and laboratory remission has often been somewhat startling—doses up to 3,500 mg. per day of cortisone being used on occasion. Needless to say, doses of this magnitude rapidly resulted in the development of many of the more severe side effects of steroid therapy. Even with the newer corticoids, prolonged therapy at such high levels must inevitably result in the appearance of these physiologic manifestations, but it is encouraging to note that thus far they do exhibit adequate control of the disease and show a tendency to spare the patient these side effects to a greater degree.

The use of the adrenocortical steroids has extended into many other fields and to many other diseases such as acute rheumatic fever, psoriasis, intractable cardiac edema, supportive therapy in severe fulminating infections, leukemia, malignancies, the adrenogenital syndrome to mention but a few. The confines of space prohibit a discussion of each of these diseases individually, but again it cannot be doubted that increased potency and a reduced incidence of side effects make the newer corticoids more potentially acceptable in the management of these conditions.

JOHN J. PEPPER, M.D.

NUCLEAR POWER AND FREE ENTERPRISE

Electrical Industry

"A political stranglehold on commercial atomic energy could eventually spell the doom of private enterprise as the free world has known it," the Guaranty Trust Company of New York warned recently.

Government power advocates are conducting a systematic campaign to obtain large sums of public money for unnecessary government nuclear energy projects. They aim to draw the government deeper into the electric power business in competition with investor-owned electric companies.

The *New York Daily News* has called these public power moves an open attempt to create a public nuclear power empire like TVA.

Investor-owned electric companies are doing the job of developing nuclear power in this country. Today sixty-nine investor-owned electric companies are participating in fourteen projects which are expected to have a generating capacity of more than 1.5 million kilowatts, constructed at a cost of well over $400 million.

At the current pace of nuclear expansion by private enterprise, it is estimated that by 1975, the total outlay for nuclear energy power plants will be more than $8 billion.

Regarding unnecessary government spending on nuclear power projects, The Guaranty Trust Company says.

> "If economic experience can be taken as a guide, the path of progress lies in further steps toward a regime of free enterprise in atomic-power development.
>
> "It certainly does not lie in the squandering of resources and energies in the establishment of government-in-business that could eventually fasten a socialist dictatorship upon the country's economic life."

DONALD UNDERWOOD

HEALTH CARE FOR OUR SENIOR CITIZENS

Prepayment of medical care for the elderly has long been a matter of urgent and continuing concern to the medical profession and its Blue Shield Plans. Within the past year, however, this problem has been made something of a political issue through the introduction of such legislation as the Forand Bill, which, if adopted, might radically affect the future of the entire voluntary health care movement in America.

What are the facts concerning Blue Shield coverage of senior citizens? What has the medical profession accomplished, through Blue Shield, to meet this challenge?

The answers to these questions will be of immediate interest as a New Congress meets—a Congress in which social welfare programs are certain to be accorded a high priority.

Some of these answers, as reported recently to AMA Council on Medical Service by the national association of Blue Shield Plans, are truly encouraging.

For example, in 1951, among a total Blue Shield enrollment of 21 million persons, nearly a million,

or a little less than 5 per cent, were over sixty-five years of age. Six years later, in 1957, among the total of 40 million persons enrolled, 2½ million (6.5 per cent) were over age sixty-five. Thus, in these six years, the number of Blue Shield members over sixty-five increased 170 per cent, while total Blue Shield enrollment increased only about 85 per cent.

Attention was called also to the fact that of the total number of people past sixty-five who have medical-surgical insurance coverage, about two-thirds are covered by Blue Shield.

Of all the people in the United States, it is estimated currently that about 15 million are over sixty-five years old, and are not cared for by an established institution or agency. This represents approximately 8 per cent of the total population. Thus Blue Shield's ratio of 6.5 per cent over age sixty-five is reasonably related even now to the ratio of the total population in that group—and is rapidly approaching parity with it.

Blue Shield has always sought to serve medicine's inescapable responsibility to the whole community. It was until recently almost an exclusively Blue Shield feature that any member on retirement, or on leaving an insured group, could retain his coverage by "conversion" to a "direct-pay" basis. Few Plans impose any age limits on initial group enrollment, and an increasing number of Plans are accepting non-group members regardless of age.

In Minnesota, an analysis based upon a 10 per cent sampling of all contracts in effect January 1, 1958, showed that 6.9 per cent of all Minnesota Blue Shield participant subscribers were sixty-five years of age or older. For Minnesota Blue Shield, there are no age limits for group subscribers. Persons up to age sixty-five years who provide a satisfactory health statement are eligible for non-group Blue Shield enrollment in Minnesota. When once enrolled, Minnesota Blue Shield coverage is never cancelled because of age. Retirees are allowed to convert to non-group contracts with full contract coverage.

MEASLES

Deaths caused by measles outnumbered poliomyelitis deaths in 1957, for the first time in fourteen years. In 1957, there were an estimated 410 measles deaths, 220 from polio. In 1944: measles 1,923; polio 1,361. Number of measles cases reported through late November, 1958: 733,000—a sharp jump from the 464,000 cases reported in all of 1957. Drug companies hope to perfect measles vaccine within a year.—*AMA News.*

Minnesota State Board of Medical Examiners

DRUG ADDICT POSING AS PHYSICIAN GIVEN SEVEN-YEAR PRISON TERM

On December 8, 1958, Donald Gerald McGregor, forty-six years of age, 801 W. 3rd Street, Yankton, South Dakota, was sentenced by the Hon. Earl J. Lyons, Judge of the District Court of Hennepin County, to a term of not to exceed seven years in the State Prison at Stillwater for attempting to obtain narcotic drugs by fraud. Judge Lyons stated that pleas had been made to him on behalf of the defendant to place him in an institution for treatment but in view of the defendant's past record the Court did not feel justified in extending leniency. McGregor, who has convictions for forging narcotic prescriptions dating back to 1933, had previously entered a plea of guilty before Judge Lyons on October 28, 1958, to the charge on which he was sentenced.

The defendant was arrested on October 20, 1958, after asking for a "shot" of demerol or a prescription for demerol tablets at an Osseo, Minnesota, clinic where he represented himself as a doctor of medicine from Alma, Georgia, stating that he had retired from practice because of a heart condition. McGregor's request for narcotic drugs was not complied with, and a subsequent investigation revealed that he was not a doctor of medicine, the defendant was charged in a criminal complaint signed by a representative of the Minnesota State Board of Medical Examiners with fraudulently attempting to obtain narcotic drugs.

Upon being questioned by the Court before sentence was pronounced, McGregor stated that he was born in Seattle, Washington, on June 15, 1912. The defendant further said that after graduating from high school, he attended Pennsylvania State College where he studied chemistry. When asked what type of work he was trained in, McGregor admitted he was not a physician and gave his occupation as that of a mechanic specializing in the repairing of business machines.

Because of having prior felony convictions, the defendant could have been given a longer prison term as provided for by law if he had been charged with those convictions in this proceeding. However, this was not done because the authorities were of the opinion that a maximum sentence of seven years in prison was sufficiently severe to fit the crime in this case. The defendant's criminal record is as follows: December 11, 1933—placed on three years probation in San Francisco, California, for forgery, November 9, 1940—sentenced at Salt Lake City, Utah, to a term of two years in the United States Penitentiary at McNeil Island, Washington, for impersonating a federal officer. On November 20, 1945, and again on June 19, 1946, the defendant was given prison terms for forging narcotic prescriptions. On the first occasion, McGregor was sentenced to a term of fifteen months in the United States Penitentiary at Leavenworth, Kansas, and in 1946 he received a sentence of eighteen months in prison at McNeil Island, Washington. On March 24, 1949, at St. Louis, Missouri, the defendant was sent to the United States Public Health Center at Lexington, Kentucky, for a period of three years, and on December 8, 1955, McGregor was sentenced at Tampa, Florida, to serve two years in the State Prison at Raiford, Florida.

President's Letter

MEDICINE AND A MEDICALLY MINDED CONGRESS

The collective eyes and ears of the nation's medical profession are focused on the 86th Congress early in its two-year existence. Medical and public health legislation, which received only token attention in the 85th Congress in 1957-58, is expected to become an important item of business during the current session.

President Eisenhower, in his budget message, called for $77 billion budget, forecasting a spending cut of nearly $4 billion, and a possible surplus of $70 million. Various spokesmen in the predominantly Democratic congress have already expressed themselves as setting their sights beyond that amount.

The welfare of the senior citizen will continue to receive added attention. The Forand Bill for financing hospital-surgical care of all social security beneficiaries is expected to gain speedy momentum with the full blessings of the liberal elements of Congress. Labor has already gone on record earmarking passage of the Forand Bill a "must" for the present session of Congress. Some observers predict that the Eisenhower administration will introduce a watered-down version of the Forand Bill. However, the big push for enactment of this bill may be postponed until 1960, an election year ripened for harvest. Look for the introduction of bills which would grant subsidies or preferred treatment to voluntary non-profit health prepayment plans which encourage enrollment of older persons. Republicans and Democrats alike could give the nod to this type of legislation.

Passage of the AMA supported Jenkins-Keogh Bill will be urged by the American Thrift Assembly this session. The bill which passed the House last session, but got lost in the Senate, would grant the self-employed a tax status similar to that of corporation employees by allowing them to refer income tax payments on earnings placed in retirement plans.

Expect an extension of the doctor-draft. The current bill due to expire June 30 may be needed to bolster the dwindling ranks of M.D. volunteers in the military services.

Medicare's $72 million congressional appropriation will be far spent by the end of the current fiscal year, which ends June 30. A deficiency appropriation may be required to defray the deficit. At the same time, it could be a show-down involving the number of Medicare benefit restrictions imposed by the last Congress, particularly those which impose military medical care rather than free choice of private physicians and hospitals.

Whether U. S. grants should help subsidize ordinary operating expenses of medical schools or be limited to construction assistance is a question bound to confront legislators.

Look for the AFL-CIO to pressure enactment of U. S. Employees Health Insurance for the nation's more than half million civil service employees.

Minnesota Senator Hubert Humphrey will combine his joint efforts with other internationally minded congressional leaders to urge the stimulation of U. S. interests in the participation of world-wide medical research.

Regardless of the outcome of legislation, anticipated or unexpected, enacted by this Congress, the free practice of medicine in the United States is destined to follow a course of no return. Your diligent consideration will be required to keep abreast of medicine—1959 on the march.

Benjamin B. Foulston M.D.

President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

MORE SOCIAL SECURITY MEANS A BIGGER STAFF

An estimated increase of approximately 3,000 additional staff workers will be required by the Bureau of Old Age and Survivors Insurance to process the increased work load due to the 1958 amendments to the Social Security Law. 1,600 Civil Service employes have already been hired. The remaining number will be required as the number of OASI recipients increases. These anticipated needs were recently disclosed by Health, Education and Welfare Secretary Flemming. It has been estimated that 12.3 million persons are now receiving OASI benefits.

STATE OF MEDICINE UNDER SOCIALIZATION IN ENGLAND

Following is a letter from a Northampton, England, doctor to the editor of the *British Medical Journal*. It points up the low state to which the medical profession has sunk in Great Britain under socialization.

SIR.—The refusal of the Government to allow us access to the courts is surely the final proof that we can expect no justice until we can negotiate from strength. Having been refused negotiation, arbitration, and now law, can we possibly regard the Royal Commission as anything but a time-occupying manoeuvre?

No other body of employes has been treated in this manner for many, many years, and to submit meekly yet again is to yield more power to our overlords and accept the will of dictatorship. This is no idle phrase. Since the lodging of our claim 2½ years ago, two steps only have been taken: The setting up of the Commission, and the 5% increase. Both of these decisions were entirely dictatorial; the profession was not consulted, the merits of the case not considered, and past promises disregarded. We acquiesced, and the power of the Government over us grew with each submission, so that when we claimed that last bastion of democracy, a court of law, that too was denied us.

Where do we go from here? One thing is certain—divided we fall. Yet so divided have we been that our leaders feel unable to take any major step without special conferences, referendums, et cetera, wasteful in time and money, and giving ample warning of our intentions. But if our leaders could be assured of our support, could have our unqualified pledge to take such action as they might recommend, then indeed they could negotiate as equals. In the end we must choose; either we trust those we elected to lead our erstwhile great profession or we abandon ourselves and all who come after us to the mercies of the politicians.

Will our leaders ask for such a pledge? Should they do so I believe the response would be overwhelming, and, given that, they assuredly have the ability to restore justice and fair dealing, and we have never looked for more.

Yours respectfully,
J. Leahy Taylor

INCREASED POPULATION MEANS INCREASED PROBLEMS

According to the Population Reference Bureau, the number of people on earth increased in 1958 by 47,000,000. This increase exceeds the total population of all the New England states, plus those of New York, New Jersey, Pennsylvania, and Maryland. In addition, the bureau points out that if the present birth rate continues, by 1980 the world population will be more than four billion, an overwhelming percentage of whom will be living in what are now known in the West, as under developed countries. How will this affect the future responsibilities of medicine? The Health News Institute points out that the nutritional problem in this prospect is obvious. Less apparent is the health problem. Millions of people will be huddled together under conditions which will be open invitations to epidemics and medical disaster.

In long-range anticipation of this population growth, a score or more of American pharmaceutical houses have in the past year announced plans to expand their overseas operations on five continents, building plants, hiring native personnel, with only American know-how in local charge.

DEATH TOLL DROP NOTED

The reduced death toll among women during pregnancy and child birth, may be ranked as an "almost unparalleled achievement of medical progress," according to Health Information Foundation reports. The Foundation points out that the maternal mortality rate in this country has dropped 93 per cent in the last four decades—from sixty-one deaths per 10,000 live births in 1915 to 4.3 deaths in 1957.

One maternal death occurs in approximately 2,300 live births today, compared with one maternal death for each 165 live births in 1915. Last year, the foundation stated, 4,200,000 babies were born in the United States; there were 1,600 maternal deaths. Had the rate of one generation ago still prevailed, the number of maternal deaths would have run as high as 28,000.

In actual fact, pregnancy and childbirth have become very minor causes of death in this country, accounting for only one-tenth of 1 per cent of all deaths and only 4 per cent of all deaths among women of childbearing age. Accidents alone cause three times the number of deaths among women of reproductive age as maternity does.

Although maternal death rates have dropped among women of all the childbearing age groups, the greatest gains have been made by women at the younger ages. The safest age group is that between twenty and twenty-four years, only 3.2 maternal deaths per 10,000 live births occur in this group. Next come women under twenty and those in the twenty-five to twenty-nine groups, each with a rate of 4.3.

Birth order is also related to safety in childbearing the foundation added. "Second births are safer than first, and third even safer than second. With fourth births maternal mortality rises again, and the hazards connected with later births begin to exceed even those in the first."

"Much of the improvement in childbirth safety," says H.I.F., "is attributable to the high level of prenatal care and hospitalization for birth now customary in this country." In 1955, 94 per cent of all live births occurred in hospitals, and 97 per cent of all births came with a physician in attendance.

The basis for today's standards of childbirth safety was established during the 1920's, the foundation pointed out. During this period, great gains were made in hospital standards of sanitation, medical research, postgraduate instruction in obstetrics, and knowledge of nutrition, obstetrical surgery, and anesthesia. Later, the improvement accelerated with the introduction of the sulfas, penicillin, and the broad-spectrum antibiotics.

If present trends continue, the Foundation concluded, "risk may be virtually eliminated from childbearing. The lowest maternal mortality rates achieved anywhere today may come to seem high, as those of former years seem now."

U. S. FUNDS FOR MEDICAL SCHOOLS?

Could this prove contagious? A dean from one of the nation's leading medical schools, has recently suggested that the time has arrived for the Treasury to help defray operating expenses of medical schools as well as subsidize physical plant improvement. This was the opinion expressed recently by Dr. Lowell T. Coggeshall, dean of the University of Chicago Medical School. The remarks of Dr. Coggeshall were part of his presidential address at the 69th Annual Meeting of the Association of American Medical Colleges held in Philadelphia. The University of Chicago Medical dean minimized fears of Federal control sequelae.

Observers have pointed out that while the Coggeshall stand does not bind AAMC, its executive council has authorized the staff to launch a one-year comprehensive study of the costs and financing of medical training. Data will be ready for Congressional inquirers.

HEW SECRETARY FLEMMING WANTS MORE DATA ON MEDICAL EDUCATION

In another development, Secretary Flemming of the Department of Health, Education and Welfare, during one of a series of conferences with health and welfare leaders, indicated he may ask various voluntary health agencies for their views on medical education. He particularly wants to know what they consider to be "fair shares": of medical education to be met by federal, state and local governments and private groups and institutions.

Conference subjects included the need for attracting more and better young people to medical careers, in the face of competition from "space, rockets and engineering;" the problem of drawing talented researchers into medicine at the college level, also in the face of scientific competition; and need for compiling a complete inventory of both government and private medical research in all its aspects. Surgeon-General Burney said the latter task was beyond the capability of Public Health Service.

DOCTOR-PRESCRIBED TRAVEL IS TAX DEDUCTIBLE

A prescribed travel expense to visit a child in a treatment center may qualify as a tax deductible medical expense item if such travel is made on competent medical advice "as an essential part of

therapy and medical management," according to a new ruling by the Internal Revenue Service. Recently this ruling involving parents of a child under psychiatric therapy at a private treatment institution some distance from the parent's home was granted. The IRS decision was based on Rev. Rule No. 58-533.

HEALTH INSURANCE RECEIVES PUBLIC APPROVAL

Seven out of every ten persons with health insurance express "complete satisfaction" with it.

This is one major finding of "Public Attitudes Toward Health Insurance," a research study by Eliot Freidson and Jacob J. Feldman based on a Foundation-supported survey by the National Opinion Research Center of the University of Chicago.

The survey consisted of detailed interviews with a representative cross-section of the American public—almost 2,400 persons in all—as well as with some 500 doctors named by the public as their family physicians.

The NORC study, still in preparation, deals with a wide range of topics relative to health and health services. The Foundation's report is limited to what the public and family doctors said about voluntary health insurance.

At the time the survey was made, in 1955, two out of every three persons interviewed had some form of hospital, surgical, or medical insurance. Seven out of ten insured persons were completely satisfied with their policies. Even among the minority without health insurance, three out of five thought that such insurance was a good idea.

About a quarter of the insured persons mentioned specific ways in which they felt existing coverage could be improved. Common suggestions were that insurance should cover more services (such as doctors' home and office visits) and a higher proportion of the total bills for presently covered hospital-surgical services. One person in six complained that premiums were too high.

Does having health insurance make a difference in the way you are treated when sick? Almost four-fifths of the public said no, according to HIF. On the other hand, 94 per cent of the doctors interviewed believed that having insurance affects the way a *patient* behaves when ill.

Insured patients, family doctors said, are more willing to undergo needed hospitalization and surgical treatment, and are more likely to seek medical attention in time. Only one doctor in five felt that having health insurance encourages patients to get unnecessary medical care. And three out of five physicians claimed that their own handling of a case is *not* influenced by the fact that a patient is insured.

"The public's regular doctors appear less satisfied with present health insurance than are their patients," the HIF report states. When these doctors were asked whether insurance should cover any costs it doesn't cover now, "only 35 per cent expressed satisfaction with present benefits. Fifty-nine per cent felt that benefits should be increased."

What added benefits are needed, as these doctors see it? The main suggestion dealt with coverage of diagnostic procedures and medical care outside hospitals. A less urgent need, physicians said, was for extension of coverage of hospital and surgical services.

RURAL PHYSICIAN SURVEY MADE IN PENNSYLVANIA

Interesting are the results of a recently completed study entitled "Rural Physicians—Their Satisfaction with Medical Practice." The report of the study was presented by Dr. William G. Mather, Head of the Department of Agricultural Economics and Rural Sociology of the Pennsylvania State University, who directed the four-year study which was initiated by The Medical Society of the State of Pennsylvania.

These findings were presented at the Eighth Annual Public Relations Conference, held in conjunction with the 108th Annual Session of the Medical Society of the State of Pennsylvania.

The purpose of the survey was to learn more about the advantages and disadvantages of rural practice, in order to advise physicians in their choice of location as well as advise communities in their attraction or retention of physicians. The survey revealed that rural physicians are well satisfied with their place of practice and that, although rural practice is hard work, it is rewarding. In addition, the survey showed that almost all babies are now hospital delivered and few major surgeries are performed outside the hospital. The report stated the rural physician is called upon to complete automobile mileages from 10,000 to 30,000 miles a year. The report recommended that the further use of partnerships and clinics should be studied, as they could relieve the phy-

sician and allow time for study and recreation. The report also stated that a community seeking a physician should analyze itself, particularly with respect to its schools, churches, recreational life; its willingness to accept a newcomer of advanced and cultural standards; and the way in which the community is accustomed to support its hospitals.

Of the 662 Pennsylvania rural physicians studied, all but eleven were men, 93 per cent were married, 69 per cent were in the age group of thirty to fifty-four years, and 70 per cent had practiced only in their present location. More than 86 per cent were engaged in general practice and only 10 per cent were registered as specialists. Ninety per cent of Pennsylvania's rural physicians were born in the state.

AMA, AHA DENOUNCE LOOK HOSPITAL STORY

The American Hospital Association and the American Medical Association have jointly taken issue with an article on practices in hospitals which appeared in the February 3 issue of *Look* magazine.

A joint release was authorized by the organizations.

Dr. Crosby, Director of the American Hospital Association, wrote a letter to Vernon C. Myers, the magazine's publisher, commenting on the article by Roland H. Berg, *Look* medical editor. He said:

"One needn't believe that everything is perfect in our hospitals—as it is not in other public service programs—to conclude that the handling of an admittedly difficult problem by Mr. Berg and *Look* was most unfortunate."

Dr. Crosby termed the article's opening sentence—"A hospital is not a fit place in which to be sick"—as "an outrageous misstatement." He said:

"This statement is disproved by an abundance of evidence; the growing acceptance by the public of the hospital as the place to get well; the direct relationship between the drop in maternal mortality rates and the increasing frequency with which hospitalization is sought for child-birth."

Dr. Crosby told the *Look* publisher that although "Mr. Berg devotes much space to patient dissatisfaction . . . the very study he quotes is at odds with his findings." The study on five hospitals in California was sponsored by the California Medical Association. Dr. Crosby said 95 and 94 per cent of the patients in the two hospitals studied in greatest detail were generally satisfied with their care and treatment.

The AHA director pointed out that hospitals for the last decade, have been continuously striving "to keep abreast of the explosive growth in medical science and to bring those advantages to the American people." He observed:

"It is difficult to keep apace, to meet the demands of the patients and physicians for even better and ever more complex care and at the same time solve the subtle human relations problem in a hospital."

"I am fearful that you may have unwittingly intensified a problem already difficult enough," Dr. Crosby wrote. He added:

"Hospital administrators face the continuous problem of fitting inadequate amounts of money to increasing great needs. It is understandable that they trim in the area of scientific needs only as a last resort. We believe that there is a major national problem in the underfinancing of hospital care; a tremendous service deficit in our hospitals. The budgets are balanced somehow. We suspect that this balance is at the expense of the kind of hospital care that medicine and hospitals could provide and the kind of hospital care we believe that a properly educated public would finance."

Dr. F. J. L. Blasingame, executive vice president of the American Medical Association, speaking for the AMA, said:

"By taking isolated examples from a limited survey and drawing general inferences from them, *Look* not only has done a grave injustice to the medical profession and to hospitals but to the readers of the magazine.

"The blanket condemnation of all hospitals, based on a survey of five hospitals out of 5,640, is deplorable. Actually, the survey reported a tremendous degree of patient satisfaction, the lowest cited figure being 94%. This was not mentioned in the *Look* article.

"While the article purportedly calls for better physician-patient relationships, it actually harms the patient's confidence in the care he will receive from his physician and in the hospital, so essential for the best in medical care. The article cannot help but increase the natural insecurity of the afflicted and the suffering.

"The article also violates the basic concepts of sound reporting. Matters such as these cannot be considered adequately or accurately covered until both sides of the question are reported fidelity and without distortion.

"The medical and hospital professions have been sincere in devoting their efforts to a continuing program of self-improvement designed to benefit our patients. We welcome constructive suggestions to help us do even better. For the sake of our patients, we must object to those we believe will be harmful."

Public Health

MINNESOTA PUBLIC HEALTH CONFERENCE LAYS PLANS FOR 1959 PROGRAM

The Minnesota Public Health Conference at its twelfth annual meeting at the St. Paul Hotel, September 18 and 19, 1958, re-elected Robert D. Ragsdale, executive secretary of the Hennepin County Tuberculosis Association, as its 1959 president. Others elected were: Dr. Robert K. Anderson, St. Paul, first vice president; Mrs. Mildred Benson, St. Paul, second vice president; and Dr. Stewart C. Thomson, Minneapolis, treasurer. Dr. John Smiley, Dr. Henry Bauer, and Richard Bond, Minneapolis, and Richard Sha, Rochester, were elected to membership on the Conference executive committee. The organization will hold its 1959 annual meeting September 24-25 at the Radisson Hotel in Minneapolis.

Recipient of an honorary membership in the Minnesota Public Health Conference for "outstanding and meritorious achievement in public health in Minnesota," was Dr. Adolph G. Liedloff, retired Mankato, Minnesota, physician and health officer. The presentation was made at the Conference's annual Albert J. Chesley, M.D. Memorial Banquet, held September 19. Making the presentation was Dr. A. B. Rosenfield of the Minnesota Department of Health.

The eighty-year-old doctor retired as part-time district health officer of District II at Mankato, in February 1956 after nearly fifty years of service in public health. He was a charter member of the Minnesota Sanitary Conference which was organized in 1907. He served one term as president of the Sanitary Conference which later became the Minnesota Public Health Conference, an affiliate of the American Public Health Association.

Dr. Liedloff served as Blue Earth County health officer from 1932 until his appointment as District II health officer on a part-time basis on May 1, 1944. His appointment to the district office was repeatedly extended beyond the normal retirement age at the request of the late Dr. A. J. Chesley and other health department officials. In one such request, Dr. Chesley stated, "He is doing a splendid piece of work for us."

A 1902 graduate of the University of Minnesota Medical School, Dr. Liedloff practiced medicine in Mankato for forty-one years beginning in 1903. In 1952, he received a fifty-year award pin from the state medical association. He was also Blue Earth County coroner from 1908-1916 and served as a captain in the Mexican Border Service from 1916-1917 and as a major in the Army Medical Corps from 1917-1919. From 1935 to 1947, he was president of the Blue Earth County Health Association.



Dr. A. B. Rosenfield (left), Director of the Division of Special Services, Minnesota Department of Health, presents Dr. Adolph G. Liedloff, Mankato, Minnesota, physician with an honorary membership in the Minnesota Public Health Conference. The eighty-year-old retired physician and health officer devoted nearly fifty years of service to medicine and public health.

The Art of Medicine

PR

Carl H. Woyke, B.A.
Editor

NEW TV CODE BANS "MEN IN WHITE"

Men in white who look like physicians or dentists on TV commercials may be on their way out of your living room, according to **Safeguard,** official publication of the Better Business Bureau.

The clamp-down refers to the tonic and toothpaste ads that try to lend credulity to messages delivered by dressing up actors as doctors or dentists and putting them in mock offices.

The Television Code Review Board of the National Association of Broadcasters has issued a ban on these ads. Previously, the board permitted such promotion as long as the words **"A Dramatization."** appeared for at least ten seconds on the screen.

The new ban precludes:

Appearances in ads of physicians, dentists or nurses, even though such portrayals are visual only.

Use of props or settings which might give viewers the impression the individual speaking is a member of the medical, dental, or nursing profession when, in fact, he is not.

References by announcers and TV pitchmen to scientific research, studies or surveys may be used only if there is actual evidence such took place, and is on record.

The board said filmed commercials, produced before June 18, 1958, could be used until January 1, 1959. No films newer than that may be used.

PRESS-PHYSICIAN SURVEY CITED

Findings of a recent survey of seventy-three newspaper editors and 320 physicians conducted by Professor Roy Carter of the University of North Carolina Journalism Department were as follows:

(1) More than one half of the editors did not know about local medical society's information services. The most frequent suggestion was that the society provide a list of spokesmen.

(2) Almost all of the editors believed that a press code would help, but only half of them were familiar with such a code.

(3) Only one third of the editors believed that adequate medical care was available for indigents.

In most cases medical society officers, public relations chairmen and older physicians included in the survey expressed fair treatment by the press. A society spokesman who had developed good relationships with newspapermen over a period of years was considered the ideal news contact by the majority of persons interviewed.

SURVEYS MAY HELP PATENT MEDICINE HUCKSTERS

Beware of surveys warns an editorial in **New York Medicine.** The editorial points out that the man in the white coat—due to intervention by medical societies, The Federal Trade Commission, and perhaps a rise in the conscience level of ethical TV broadcasters—is dwindling. However, the medical survey technique is now appearing and the insidious thing is that this is accomplished by the unthinking co-operation of physicians themselves.

Under the guise of scores of different titles with high sounding names like information bureaus, patent medicine drug companies are sending physicians questionnaires on their prescribing habits—what drugs they prescribe for what ailments. Usually these are sent on a nonpayment basis. However,

some of the more elaborate surveys will pay the physician for filling out the forms.

One end result is that we now have a new crop of patent medicine advertising on TV and radio the "Medical Survey says . . ." type of commercial. Another variation makes its pitch that Kokotomahawk or whatever the name, is just what the doctor ordered for it contains the ingredients which eight out of seven doctors recommend, according "to the latest survey."

This knowledge should at least forewarn the physician. In answering any survey on your prescription habits, make sure that the survey is under proper medical sponsorship and not just the screen for some clever advertising agency and patent medicine manufacturer.

Physicians can legitimately complain if white coat dramatizations fool the TV public on patent medicines. Physicians can blame no one but themselves if they fall for the "survey" type of advertising exploitation and provide the data that made the survey possible.

TEEN GROUP TO STUDY ALCOHOL AND HEALTH

Since alcoholism is considered more and more a medical problem, your society may be interested in working with a group that discourages drinking among teenagers. The group is Allied Youth, Inc., and its program attempts to show teens that alcohol and adolescents do not and need not mix. In February, Allied Youth groups in high schools all over the country will be studying "Alcohol-Adolescents and Health." Medical societies can help by supplying speakers, securing films and exhibits or just volunteering their services ahead of time for whatever the teens have in mind.

Allied Youth has as its fundamental, a solid core of students in each school who can prove to other teens that they don't need to drink to have a good time.

MICHIGAN OFFERS TRAINING FOR MEDICAL ASSISTANTS

A Medical Assistants Inservice Training Program has been developed by the University of Michigan. The project is sponsored by the Education Committee, Michigan State Medical Assistants Society.

The Michigan Medical Assistants Training Program includes an M.D. advisory committee to the medical assistants at the state and county levels.

The co-operating faculty includes The School of Business Administration, The School of Nursing Medical School, The Department of Psychology, and the College of Literature, Science, and the Arts of the University of Michigan.

Pilot courses will be offered in Battle Creek, Detroit, Flint, Jackson, Lansing, and Pontiac. These centers adjacent to Ann Arbor have been selected to give faculty members of the University the opportunity to work with medical assistants in the area in developing useful and usable course content. Upon completion of the pilot program, published courses of study will become the property of the Education Committee of the Michigan State Medical Assistants Society, to be used by that Committee as the basis for offering the inservice training program in centers throughout the State of Michigan.

Each course will meet for sixteen two-hour sessions. Courses will begin in late September and middle February of each year, generally on Thursday evenings and in the classroom of the nurses' home connected with a hospital in the course center. A fee of $27.00 per course will be charged.

Any member of the Michigan State Medical Assistants Society who has completed the full six courses will be registered with the Michigan State Medical Assistants Society and with the State Office of the Michigan Medical Society as a Certified Medical Assistant.

The Extension Service of The University of Michigan will award a certificate of completion to all students who satisfy minimum attendance requirements for five of the six courses.

Course descriptions include: Medical Information for Medical Assistants, Nursing Information for Medical Assistants, Law and Economics in Medical Office Administration, Medical Office Management, Psychology of Human Behavior and Dynamics of Human Behavior.



when psychic symptoms distort the picture

Dartal helps the patient reintegrate his mental processes

In everyday office practice as well as under hospital conditions Dartal is consistent in its effects as few tranquilizers are.

Dartal promotes emotional balance

Dartal effectively decreases or relieves emotional hyperactivity and psychomotor excitement.

Dartal is unusually safe

At a recent symposium, leading hepatologists* concluded that Dartal is not icterogenic or hepatotoxic.

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One 2-mg. tablet q.i.d. or one 5-mg. tablet t.i.d. in neuroses; one 10-mg. tablet t.i.d. in psychoses.

a superior psychochemical
for the management of both major and minor emotional disturbances

Dartal®

dihydrochloride — brand of thiopropazate dihydrochloride

SEARLE

*A Symposium on the Pharmacologic Effects of Dartal on the Liver, Chicago, Searle Research Laboratories, Feb. 7, 1958.

SPONTIN IN SERIOUS

A Special Report from Abbott
to the Medical Profession
on a Year's Clinical Experience
with SPONTIN®
(Ristocetin, Abbott)

In a Spanish province, a patient lay dying of endocarditis. A short wave radio appeal for SPONTIN was intercepted by a Baltimore physician. The antibiotic was immediately flown to this faraway land, and 10 days later—the patient had recovered.

In Chicago, a moribund patient had been administered 18 combinations of 10 different antibiotics without success. Involved was a hospital-acquired staphylococcal pneumonia—plus complications. SPONTIN was substituted and the patient lived.

A five-week-old infant was critically ill with staphylococcal enteritis. Treatment failures included erythromycin and chloramphenicol. Three days of SPONTIN saved this life. The list is long and impressive and it grows daily.

Recently, a study[1] was made of serious and resistant staphylococcal infections reported to Abbott Laboratories. Many of these cases had serious complicating diseases—many were moribund, or almost so, at the time SPONTIN was started. Yet, out of the 160 staphylococcal cases studied, 93 were reported cured and 38 improved after the administration of SPONTIN.

Out of the total of 251 patients with severe infections caused by gram-positive or mixed organisms, 149 were reported cured and 53 others improved. And the record for pediatric practice was every bit as good.

Additionally, SPONTIN continues to exhibit exceptional bactericidal activity against coccal infections[2]. And, according to another study, SPONTIN provides successful short-term therapy in endocarditis[3].

901086

Only last October, at the Antibiotics Symposium in Washington, D. C., a panel of six leading antibiotic experts placed SPONTIN at the top of all other commercially-available antibiotics for treating serious staphylococcal infections. Also, six papers—all dealing with the effectiveness of ristocetin (SPONTIN®) in treating staphylococcal infections—were presented at the Symposium.

One of the most encouraging aspects of the year's literature on SPONTIN is the increasing testimony to its safety. As the months have passed and cases have accumulated by the hundreds, it has become apparent that careful attention to dosage recommendations has practically eliminated toxicity and side effects as serious obstacles to therapy. Also, recent improvements have been made in the manufacture of SPONTIN; the drug is now made from pure crystals.

A recent report[4] in the Journal of the American Medical Association concluded, "It is our opinion that, if proper precautions are observed, ristocetin is a [well tolerated] and potent agent to employ in the treatment of staphylococcal infections." And in another study, after successfully treating 28 patients with a variety of staphylococcal infections, the authors reported[5], "No serious complications were noted."

Few more dramatic records have been written in such a short space of time. SPONTIN has proved itself to be a good answer, perhaps the best answer at present, to the resistant staphylococcal problem—and of real value in other serious coccal infections. It may well be your answer when you're confronted with a serious infection.

Abbott

STAPHYLOCOCCAL INFECTIONS

Excerpts from Reports Read at the Antibiotics Symposium

Spontin In Treating Severe Respiratory Infections —"In 13 of 20 patients the results were excellent, with clinical response being evident within one to four days after institution of therapy. In three additional patients, there was some degree of improvement in pneumonic processes superimposed on tuberculosis in two cases and on pulmonary neoplasm in one. In all other cases, serious antecedent pathology undoubtedly influenced the negative or equivocal response to ristocetin therapy.[6]"

Spontin In Treating Staphylococcal Infections—After successfully treating 28 patients, the authors wrote, "Ristocetin or Spontin has proved to be bactericidal and bacteriostatic, particularly for the *Staphylococcus aureus*, which is often resistant to many other antibiotics.[5]"

Spontin In Treating Seven Difficult Cases – "Ristocetin has produced excellent results in eradicating, mitigating or preventing infection in seven selected difficult cases. Six of the seven cases involved *Staphylococcus aureus* which did not respond to chemotherapy with other antibiotics.[7]"

Spontin Blood Levels In Children – "Ristocetin was administered as a single intravenous injection of 12.5 milligrams per kilogram. This resulted in serum levels ranging from 1.3 to 10.6 mcg. after two hours with a gradual fall to a level of 0.7 mcg. per cubic centimeter or less after 12 hours.[8]"

Spontin In Treating Staphylococcal Pneumonia —"Ristocetin was used in the treatment of 24 patients with staphylococcal pneumonia, 17 of whom had failed to respond to previously administered antibiotics. Complete clearing of pneumonitis was obtained in 16 patients and significant improvement occurred in two others. Two patients died of pneumonia; four others succumbed to other lethal diseases.[9]"

Spontin In Treating Children and Adults – "Ristocetin completely controlled severe staphylococcal infections in 11 adults and six children who received adequate therapy.[10]"

1. Totals represent published reports and personal communications to Abbott Laboratories.
2. Sixth Annual Symposium on Antibiotics, Washington, D. C., Oct. 15, 16, 17, 1958.
3. Romansky, M. J., and Holmes, R., Successful Short-Term Therapy of Enterococcal and Staphylococcal Endocarditis with Ristocetin—Seven Patients. Preliminary Report, Antibiotics Annual, 1957-58, p. 187.
4. J. A. M. A., 167:1584, July 26, 1958.
5. Bush, L. F., et al., The Use of Ristocetin (Spontin) in Staphylococcal Infections, In Press, Antibiotics Annual, 1958-59.
6. Billow, F. J., et al., Clinical Observations on Ristocetin—A Preliminary Report on its Efficacy and Toxicity in 20 Unselected Severe Respiratory Infections, In Press, Antibiotics Annual, 1958-59.
7. Miller, J. M., et al., Ristocetin in the Treatment of Seven Selected Difficult Cases, In Press, Antibiotics Annual, 1958-59.
8. Asay, L. D., et al., Ristocetin Serum Levels in Children, In Press, Antibiotics Annual, 1958-59.
9. Schumacher, L. R., et al., Experiences with Ristocetin in Staphylococcal Pneumonia: Observations in 23 Cases, In Press, Antibiotics Annual, 1958-59.
10. Terry, R. B., Ristocetin in Children and Adults, In Press, Antibiotics Annual, 1958-59.

Minnesota Blue Cross—Blue Shield

Dr. Edwin J. Simons, the Executive Director of Minnesota Blue Shield, unexpectedly passed away on December 11, 1958. In his death the medical profession lost a highly regarded member, Blue Shield lost a strong proponent, and the people of Minnesota lost an exemplary citizen dedicated to serving mankind.

Dr. Simons joined Blue Shield as medical director in 1950. On January 1, 1954, he accepted the position of executive director, but continued also to carry out the duties of the medical director. Under his leadership the Blue Shield Plan experienced its greatest growth and progress. The number of participant subscribers increased tremendously. The scope of coverage was greatly broadened consistent with advances in the science of medicine. The reserve structure of the Plan was strengthened, thereby assuring the public and the profession of an economically sound organization, yet the cost of coverage was kept sufficiently low as to be within the financial reach of any segment of Minnesota's population.

Dr. Simons was always deeply concerned with maintaining the free choice of physician and the unfettered relationship which should exist between the doctor and patient. He firmly believed that an effective Blue Shield program would help assure free choice of physician and close doctor and patient relationships. Toward these ends he directed Blue Shield operations.

Prior to joining Blue Shield Dr. Simons practiced general medicine in Swanville, Minnesota, for approximately 25 years. He also served as medical director of the Minnesota Division of Social Welfare for five years.

Dr. Simons was well known by Minnesota doctors, having been a member of the Upper Mississippi Medical Society and the Minnesota State Medical Association. He served the Upper Mississippi Medical Society as president in 1935 and the Minnesota State Medical Association as president in 1946.

Dr. Simons' associates in Blue Cross and Blue Shield are grateful for having had the opportunity of knowing and working with him. His example, devotion and knowledge of Blue Shield affairs served as an inspiration to everyone associated with the Plan.

* * *

The most recent figures compiled by Minnesota Blue Cross indicate that the number of subscribers receiving hospital care through their Blue Cross coverage totaled 215,729 during 1958.

This represents subscriber usage of 504 cases paid per year per 1,000 contracts protected, an increase of nearly 5 per cent over the rate of usage experienced during the preceding year.

During the year 1958, Blue Cross subscribers received hospital care benefits in excess of $34,000,000. This represents an increase of 18 per cent over the benefits provided subscribers during the preceding year.

Days of hospital care provided subscribers during 1958 totaled 1,332,580 which represents over three days of hospital care for every Blue Cross contract in effect during the year.

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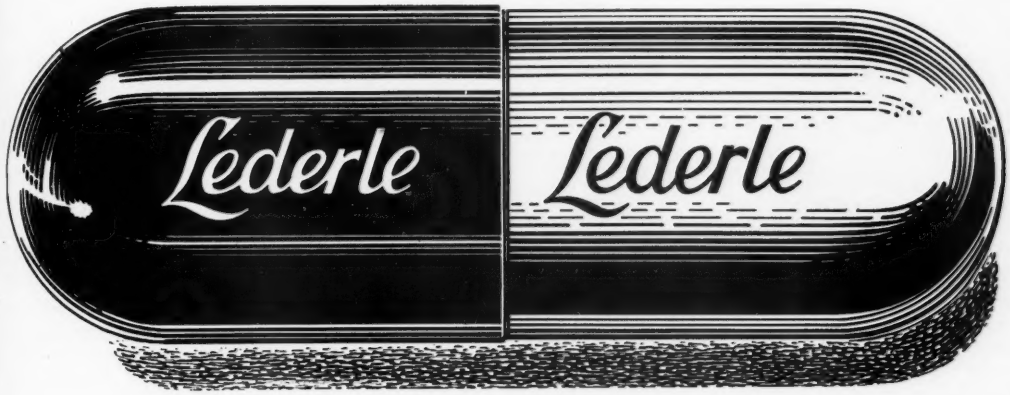
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Tetracycline with Citric Acid Lederle

SUPPLIED IN CAPSULES OF 250 MG.
WITH 250 MG. CITRIC ACID.
AND 100 MG. WITH 100 MG. CITRIC ACID.

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In Memoriam

DON F. FITZGERALD

Dr. Don F. FitzGerald died December 8, 1958. He was ninety-two years of age at the time of his death.

The deceased received his early schooling in New Orleans, Louisiana, New Haven, Connecticut, Albany and Brooklyn, New York. He came to Minneapolis at the age of eighteen and became a correspondence clerk at the Nicollet National Bank, later absorbed by the First National Bank.

He was a Spanish-American War Veteran and served with the Thirteenth Regiment of Minnesota in the Philippines in 1898. Upon returning in 1899, he enrolled in the University of Minnesota Medical School where he earned his medical degree, a graduate of the class of 1903. In 1953, Dr. FitzGerald was granted a membership in the Fifty-year Club of the Minnesota State Medical Association, and he was a member of the Hennepin County Medical Society. In 1953, also, the University of Minnesota designated him as Graduate Emeritus.

Dr. FitzGerald is survived by his wife, Isabelle, and three sons, Don, Santa Barbara, California; Norman, Corona del Mar, California; and Gerald, West Caldwell, New Jersey.

JOHN H. HIGGINS

Dr. John H. Higgins, a Minneapolis practicing physician for more than fifty years, died December 31, 1958. He was eighty years of age at the time of his death. Born in Milwaukee, Wisconsin, Dr. Higgins had lived in Minneapolis for sixty years.

He was a graduate from the University of Minnesota Medical School in 1903 and practiced medicine until the time of his retirement three years ago.

Dr. Higgins was a member of the staff of Asbury Hospital, a member of the Hennepin County Medical Society, the Minnesota State Medical Association, and the American Medical Association. He was also a member of Workmen's Lodge, Woodmen and Odd Fellows.

Surviving are his wife, Grace L.; a daughter, Mrs. William H. Mahnke; a son, John C.; three grandchildren, and a sister, Marguerite I., all of Minneapolis.

FRANCIS J. SAVAGE

Dr. Francis J. Savage, a long-time St. Paul physician and former president of the Minnesota State Medical Association, died of a heart attack on January 16, 1959. He was eighty-three years at the time of his death.

The deceased, for many years, was a surgeon for the Great Northern Railroad. He was active in the private practice of medicine until the time of his retirement in May, 1958.

In 1954, he received the distinguished service award of the Minnesota State Medical Association. He served as state president in 1934 and was a former member of the council and delegate to the American Medical Association.

In 1951, Dr. Savage became a member of the Fifty-year Club.

A native of Stockbridge, Massachusetts, Dr. Savage received his medical degree from the University of Minnesota in 1901. He interned at Minneapolis General Hospital and served eighteen months as an Army Captain during World War I. In 1927, he served as president of the Ramsey County Medical Society.

He is survived by his wife, Mary; a daughter, Mrs. Townsend B. Pettit, Jr., of Garden City, Long Island, and two grandchildren.

ISAAC F. SEELEY

Dr. Isaac F. Seeley, Northfield physician for forty-two years, died January 3, 1959, at his home in Tucson, Arizona. He was seventy-eight years old at the time of his death.

The former Northfield physician retired in 1950 to his Arizona home after completing forty-six years in the practice of medicine.

Dr. Seeley was born in 1881 in the pioneer Minnesota village of Cordova in Le Sueur County. His father, John S. Seeley, was a physician in Cordova before moving to Faribault. In Faribault, the senior physician served actively in the practice of medicine for forty-five years.

Dr. Isaac Seeley received his medical degree from the University of Iowa in 1904. Following the completion of his education, he practiced for about one year in Elysian. Next, he accepted a position as physician with construction companies building the Milwaukee Railroad lines through the Rocky Mountains. He continued in this phase of his career for approximately two years. He served for many years as health officer for the city of Northfield.

He was a member of the Rice County Medical Society, the Minnesota State Medical Association and the American Association of Railroad Surgeons. A member of the Masonic Fraternity, Dr. Seeley had been presiding officer in all the local bodies, including Social Lodge, No. 48, A.F. & A.M. of Northfield and Faribault Commandery, Knights Templar. He was a member of the Ozman Temple of the Shrine, in St. Paul. He served as Grand Master of the Grand Council of Minnesota and was a keenly interested participant in Masonic work for many years.

Surviving Dr. Seeley are his wife, Alice; his son, Sanford; and two step-daughters, Mrs. Robert Epstein (Audrey) of Tucson, and Mrs. James Young (Patricia) of Albuquerque, New Mexico.



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Sound, conservative therapy with salicylates has been consistently reaffirmed as basic, long-term maintenance therapy in the arthritides.[1,2,3]

Buffered Pabirin provides superior maintenance therapy. It epitomizes fundamental long-term basic therapy since it can be given month after month without serious complications and with minimal problems to patient and doctor alike.

Buffered Pabirin is formulated to provide high and sustained salicylate blood levels. Each tablet consists of an outer layer containing a buffer (aluminum hydroxide), para-aminobenzoic acid, and ascorbic acid; a core of acetylsalicylic acid.

In the stomach, the outer layer quickly releases the buffer, which protects against nausea, dyspepsia and other gastrointestinal symptoms so frequently encountered with salicylates alone. The core of Buffered Pabirin then disintegrates rapidly, permitting rapid absorption of the acetylsalicylic acid for faster pain relief.

References: 1. Hart, D.; Bagnall, A. W.; Bunim, J. J., and Polley, F. H.: Ninth International Congress on Rheumatic Diseases, Toronto, Ont. (June 25) 1957. 2. Report of Joint Committee, Medical Research Council & Nuffield Foundation, Treatment of Rheumatoid Arthritis, British Medical Journal (April 13) 1957. 3. Friend, D. G.: New England J. Med. 257:278 (Aug.) 1957.

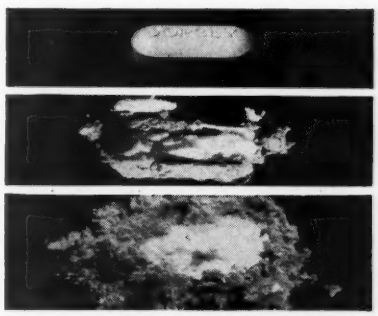
Buffered Pabirin® *Tablets*

Each tablet contains:

Acetylsalicylic acid (5 gr.)	300 mg.
Para-aminobenzoic acid (5 gr.)	300 mg.
Ascorbic acid	50 mg.
Dried aluminum hydroxide gel	100 mg.

All Buffered Pabirin is sodium- and potassium-free.

Dosage: Two or three tablets 3 or 4 times daily.



Photographs show 2-stage Tandem Release disintegration.

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Meetings and Announcements

NATIONAL

American College of Allergists Graduate Instructional Course and Annual Congress, March 15-20, 1959, Mark Hopkins Hotel, San Francisco, California. Contact: John D. Gillaspie, M.D., Treasurer, 2049 Broadway, Boulder, Colorado.

American College of Surgeons sectional meetings:

March

Four-day Sectional Meeting for Surgeons and Nurses, Kiel Auditorium, St. Louis, Missouri, March 9-12. Dr. Frank McDowell, St. Louis, Local Chairman for Surgeons Meeting; Miss Joyce Brueggeman, R.N., Local Chairman for Nurses Meeting; Dr. Michael L. Mason, Secretary, 40 East Erie Street, Chicago 11, Illinois.

April

Four-day Sectional Meeting for Surgeons and Nurses, The Queen Elizabeth Hotel, Montreal, Quebec, April 6-9. Drs. Harry S. Morton and Charles Edouard Hebert, Montreal, Local Chairmen for Surgeons Meeting; Miss Moyra Allen and Sister Denise Lefevre, Montreal, Local Chairmen for Nurses Meeting; Dr. Michael L. Mason, Secretary, 40 East Erie Street, Chicago 11, Illinois.

September

Annual Clinical Congress, Atlantic City, New Jersey, September 28-October 2. Dr. Michael L. Mason, Secretary, 40 East Erie Street, Chicago 11, Illinois.

Mediclinics, fourth annual refresher course of postgraduate medical education, Fort Lauderdale, Florida, March 2-12, 1959. (Acceptable for 32 hours of postgraduate study—Category I credit for American Academy of General Practice members).

INTERNATIONAL

Association of the National European and Mediterranean Societies of Gastroenterology sixth meeting, Leiden, The Netherlands, April 20 to 24, 1960.

VENEREAL DISEASES SYMPOSIUM SCHEDULED

The Tenth Annual Symposium on Recent Advances in the Study of Venereal Diseases will be held April 27-28, 1959, at Johns Hopkins University, Baltimore, Maryland. The sessions are open to all physicians and workers in allied fields who are interested in the venereal diseases.

This Symposium, sponsored jointly by the American Venereal Disease Association and the Public Health Service, will precede a Venereal Disease Seminar for public health personnel of fourteen eastern states, beginning April 29.

Anyone wishing to present a scientific paper on a subject related to venereal diseases should mail preliminary abstracts to Dr. William J. Brown, chairman of the Program Committee, by February 15. Address: Communicable Disease Center, Public Health Service, 50 Seventh Street, N.E., Atlanta 23, Georgia. The committee will meet in mid-February to select papers to be presented.

Authors of accepted papers will be notified before March 15.

HEARING SOCIETY ANNOUNCES AWARD COMPETITION OPENING

Competition for the 1959 Kenfield Memorial Scholarship, awarded annually by the American Hearing Society to a prospective teacher of lipreading, will open February 1.

Winner of the scholarship will be entitled to take a course in "Methods and Practice in Teaching Lipreading" from any school or university in the United States offering a course acceptable to the teachers committee. A requirement is that the scholarship be used within one year after date of award.

Rules for competition state that a satisfactory applicant shall be a "well-adjusted individual with a pleasing personality, legible lips, good speech, and voice, and no unpleasant mannerisms." Graduation from college, with a major in education, psychology, and/or speech is a requirement.

Application blanks may be obtained by writing to Miss Ruth Bartlett, chairman of the society's teachers committee, 432 So. Curson Ave., E., Los Angeles 36. Completed applications and recommendations must reach Miss Bartlett by April 1.

RESEARCH IN PREVENTION OF BLINDNESS

The Research Committee of the National Society for the Prevention of Blindness invites requests for research grants in 1959. Funds are available for projects that may contribute to basic understanding of eye function and pathology, or that may improve methods of diagnosis, treatment or prevention of blinding eye diseases. Grants will be made this spring for requests received prior to May 1, and inquiries can be addressed to Research Committee, National Society for the prevention of Blindness, 1790 Broadway, New York 19, New York.

MAYO CLINIC REVIEWS DATES SET

Staff members of the Mayo Clinic and the Mayo Foundation for Medical Education and Research will present again this year a three-day program of lectures and discussions on problems of current interest in general medicine and surgery, April 13, 14, 15, 1959.

Up to twenty-one hours of Category I credit may be

(Continued on page A-54)

for depression

▲Deprol▲†

Clinically confirmed in over 2,500 documented case histories[1,2]

CONFIRMED EFFICACY

Deprol ► acts promptly to control depression *without* stimulation

► restores natural sleep

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DOCUMENTED SAFETY

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Deprol is unlike central nervous stimulants

► does not cause insomnia

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► has no depression-producing aftereffects

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Dosage: Usual starting dose is 1 tablet q.i.d. When necessary, this dose may be gradually increased up to 3 tablets q.i.d.

Composition: Each tablet contains 400 mg. meprobamate and 1 mg. 2-diethylaminoethyl benzilate hydrochloride (benactyzine HCl).

Supplied: Bottles of 50 scored tablets.

1. Alexander, L.: Chemotherapy of depression—Use of meprobamate combined with benactyzine (2-diethylaminoethyl benzilate) hydrochloride. J.A.M.A. 166:1019, March 1, 1958. 2. Current personal communications; in the files of Wallace Laboratories.

†TRADE-MARK CD-7469

Literature and samples on request WALLACE LABORATORIES, *New Brunswick, N. J.*

LETTERS
TO THE MEDICAL DIRECTOR

Dear Doctor:

Rauvera* was used on five patients with essensential hypertension varying from moderate to severe. The highest blood pressure was 220/130 and the lowest 180/105.

All patients have shown a consistent response to the drug and the continuation therapy has effected a good control so far . . . approximately two to three months. In four patients systolic blood pressure was reduced from 20 to 50 mm. Hg and the diastolic from 10 to 15 mm. One patient, who had a pressure of 220/130 has had a phenomenal response, and I brought the systolic down to 165 and the diastolic to 95.

M. D., Wisconsin

Dear Doctor:

Rauvera has produced satisfactory reductions of blood pressure in every hypertensive case in which I have used it.

M. D., Colorado

Dear Doctor:

Rauvera tabs are my choice for hypertension over 170 . . . they give me the best results.

M. D., Texas

Comment: *It is interesting to note that no adverse side effects were reported in connection with Rauvera's effective antihypertensive action.*

*Rauvera contains 1 mg. alseroxylon (purified Rauwolfia serpentina alkaloid), 3 mg. alkavervir (Veratrum viride fraction) in each scored tablet.

SMITH-DORSEY • Lincoln, Nebraska

MAYS CLINIC REVIEWS DATES SET

(Continued from page A-52)

obtained by American Academy of General Practice members who attend.

There are no fees for this program.

The number of physicians who can be accommodated is necessarily limited. Those wishing to attend should communicate with the Clinical Reviews Committee, Mayo Clinic, Rochester, Minnesota.

RESULTS OF COUNTY MEDICAL SOCIETY ELECTIONS

Blue Earth County

Officers for the present year were elected at a dinner meeting of the Blue Earth County Medical Society held at the Century Club in Mankato. They are Dr. G. E. Penn, president; Dr. J. T. Olive, vice president; and Dr. R. A. Sanford, secretary-treasurer. Terms are for one year. Outgoing officers are Dr. J. C. Von Drasek, president; Dr. R. D. Roth, vice president; and Dr. D. B. Swenson, secretary-treasurer.

Clay-Becker Counties

The Clay-Becker Medical Society held its annual meeting in the Hawley Lutheran Church recently.

Business of the evening included the election of officers and committee members. Dr. Arvin Houglum of Lake Park was named to a committee of public relations along with Dr. Arnold Larson, Detroit Lakes, Dr. O. H. Johnson and Dr. James Lucan, both of Moorhead.

Dr. V. J. Carlson of Moorhead was elected president with Dr. Virgil Larson, Detroit Lakes, president-elect; Dr. Carl Siminson, Barnesville, vice president; Dr. James Oliver, Moorhead, secretary-treasurer; and Dr. J. B. Rutledge, Detroit Lakes, historian.

Park Region

The Park Region District and County Medical Society held its annual meeting at the Ranch House in Fergus Falls recently. Dr. Lester R. Parson, president presided, and the scientific program was presented by Dr. Chen En Lu and Dr. Richard Ness of Fergus Falls, who spoke on subjects in their respective fields.

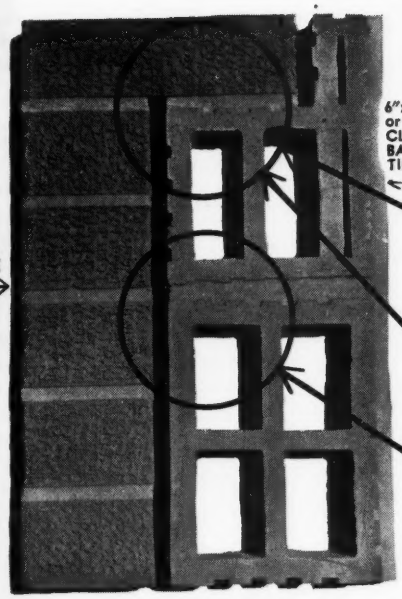
The following officers were elected for the year of 1959: Dr. Henry A. Korda, Pelican Rapids, president; Dr. David J. Sanderson, Fergus Falls, president-elect; Dr. Charles W. Lewis, Henning, vice president; Dr. Peter M. Geiser, Alexandria, secretary; Dr. Carl J. Lund, Fergus Falls, treasurer; Dr. Edwin J. Tanquist, Alexandria, Dr. V. A. Doms, Battle Lake, executive committee; Dr. Glen J. Mouritsen, Fergus Falls, delegate; Dr. Norman H. Baker, Fergus Falls, alternate delegate.

Red River Valley

Dr. Hubert D. Clapp, Crookston, was elected president of the Red River Valley Medical Society when the group held its annual meeting recently at Sidney's Cafe in Crookston. M. D. Tyson, civil defense coordinator

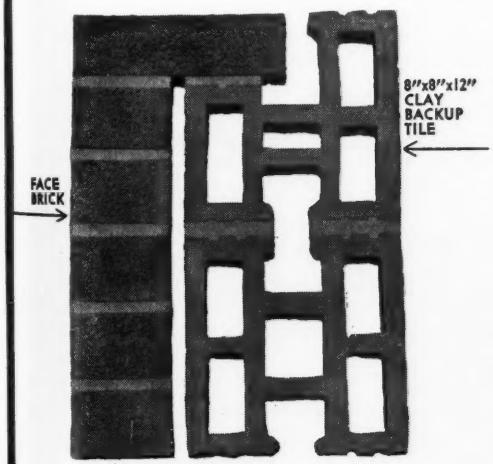
(Continued on page A-57)

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FOR 10" WALL

(6" Backup is load bearing, passes 2 hour fire test, saves two inches of space.)



FOR 12" WALL

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1. Header provides positive bond with face brick — eliminates movement in the wall, thus reducing cracking, expansion and contraction problems.
2. All tile plastering surface.
3. Vertical alignment of shells and webs provides maximum compressive strength.
4. No through mortar joints to conduct heat or moisture through the wall. Clay tile is free from soluble salts which can contribute to efflorescence.
5. Uniform coursing heights for exposed interiors.
6. Available in textured or scraped face for exposed interiors. Write for literature.

You *can* be sure when you specify Denison Clay Tile backup — for you know it will perform perfectly, you know it will assure long life and complete satisfaction in the building you design. You need not run the risk of damp, cold buildings, high maintenance and heating costs, cracked walls and hard-to-clean interiors. Specify Denison Clay Backup Tile and you know you're right!

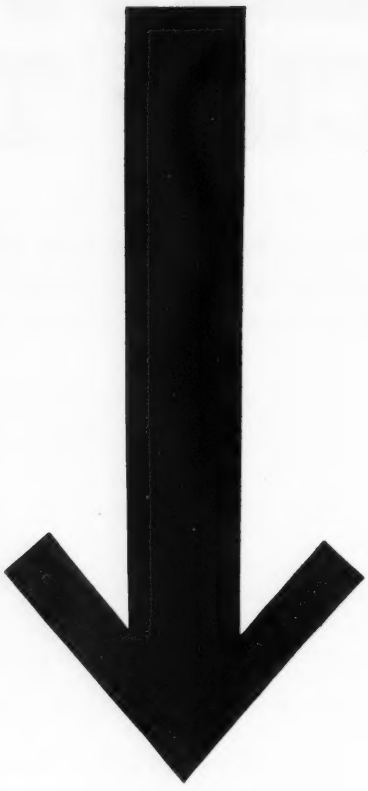
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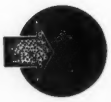
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EASES EVACUATION



* Unique encapsulation of millions of minute oil globules by Irish moss assures complete penetrant diffusion in stools.

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TO SOFTEN STOOLS WITHOUT TISSUE DEHYDRATION AND MAKE THEM MOVE WITHOUT STRAINING

KONDREMUL®

COLLOIDAL EMULSION OF MINERAL OIL AND IRISH MOSS patch

PROVEN SAFE...EFFECTIVE • IN PREGNANCY • IN CHILDHOOD • IN MIDDLE-AGED PATIENTS • IN ELDERLY PATIENTS • **THROUGH MORE THAN 25 YEARS OF USE**

AVAILABLE in three pleasant-tasting formulas:

for the average patient
KONDREMUL (Plain)
containing 55% mineral oil. Bottles of 1 pint.

for more hypotonic cases
KONDREMUL WITH CASCARA
0.66 Gm. non-bitter Ext. Cascara per tablespoonful.
Bottles of 14 fl.oz.

for more resistant constipation
KONDREMUL WITH PHENOLPHTALEIN
0.13 Gm. (2.2 gr.) phenolphthalein per tablespoonful.
Bottles of 1 pint.

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70 YEARS OF SERVICE TO THE MEDICAL PROFESSION

RESULTS OF COUNTY MEDICAL SOCIETY ELECTIONS

(Continued from page A-54)

of the State Department of Health, discussed the new concepts of Civil Defense and Disaster Control. Tom Cook, executive secretary, Hennepin County Medical Society, Minneapolis, talked on the problems of public relations for physicians.

Other officers elected to serve with Dr. Clapp were: Dr. Clifford J. Stadum, Twin Valley, vice president; Dr. Russell O. Sather, Crookston, secretary-treasurer; Dr. Edgar L. Sather, Fosston, censor; Dr. Lester N. Dale, Red Lake Falls, delegate to the Minnesota Medical Association House of Delegates with Dr. Eskil Erickson, Halstad, alternate.

St. Louis County

Dr. John H. Peterson, Duluth, has been elected president-elect of the St. Louis County Medical Society. Results of the society election were announced at the organization's annual dinner-dance in the Kitchi Gammi club. His election opponent was Dr. W. C. Martin. Peterson takes office in 1960. Dr. John C. Feuling, incumbent president, will be succeeded in 1959 by Richard Barton, M.D.

Dr. Herbert O. Hoff was elected vice president. New secretary-treasurer will be Dr. Robert J. Goldish, succeeding Dr. R. O. Bergan. Dr. Bergan was named to a three-year term on the advisory committee.

Winona County

Dr. L. J. Wilson, Winona, has been elected president of the newly reorganized Winona County Medical Society.

He was one of five officers elected at the society's annual meeting at which a new constitution and by-laws—establishing for the first time a board of directors—were adopted.

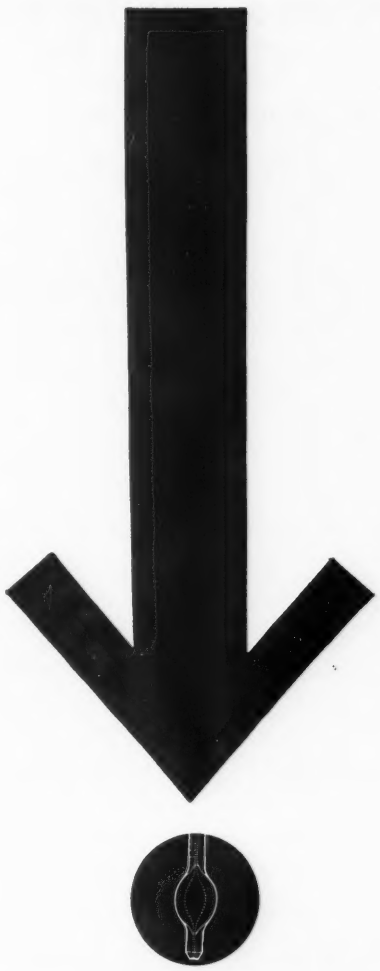
One of the principal objectives of the formation of a five-member board was to develop better communications.

Up to the present time the society has met in quarterly sessions but the new board of directors may be called together at any time the president feels that there is a matter calling for attention of the group.

The annual meeting was held January 7 at Hotel Winona and was attended by members of the society and their wives.

Dr. Wilson succeeds Dr. Carl Heise as president. Other officers of the society are: Dr. Warren W. Haesly, vice president; Dr. Charles W. Rogers, secretary-treasurer; Dr. G. L. Loomis, director for one year, and Dr. Paul Heise, director for two years.

Dr. L. I. Younger was named delegate to the Minnesota State Medical Association and Dr. Howard Satterlee, Lewiston, alternate delegate.



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- particularly valuable for pregnant and geriatric patients
- easy to take — in small, thinly coated tablets

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Vitamin B_{12} crystalline with intrinsic factor concentrate	0.5 U.S.P. unit*
Thiamine hydrochloride	2.5 mg.
Ascorbic acid	50 mg.
Betaine hydrochloride	60 mg.
Methylcellulose	32.5 mg.

*Potency established before formulation.

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Woman's Auxiliary

BLUE EARTH MEDICAL AUXILIARY TO SEND DRUGS TO BAHAMAS

Members of the Blue Earth County Medical Auxiliary, are undertaking a unique project which will result in a supply of free drugs to people of the Bahama Islands.

The Medical Auxiliary is collecting the drug samples, sent to their husbands by various pharmaceutical firms and not ordinarily utilized, and sending them to the Nassau County Health Department in the Bahama Islands for distribution by doctors to Bahamians.

The drug supplies are turned over by the auxiliary to Mrs. Eva Quiram of Waterville, formerly with the Health Service in Nassau, who sends the drugs there.

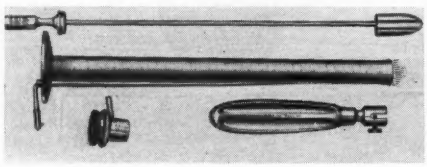
Another collection of drug supplies will be made by the auxiliary in the spring. The collecting is done with the consent of the Blue Earth County Medical group.

HENNEPIN COUNTY AUXILIARY ACTIVITIES

On Friday, January 16, the Woman's Auxiliary to the Hennepin County Medical Society held its area coffee parties. The prime objective of these parties is to afford the individual member an opportunity to become better acquainted with the other members from her own area, thus consolidating the membership of the auxiliary as a whole.

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Mrs. Conrad Holmberg, Civil Defense and Safety Chairman, had available for distribution information regarding the most recent developments in civil defense.

The following women graciously opened their homes for the parties, and the auxiliary wishes to express its appreciation to them:

Mrs. Rolf L. Andreassen, 3829-19th Ave. So.; Mrs. Aaron Friedell, 2700 Chowen Ave. So.; Mrs. Nathaniel H. Lufkin, 330 E. Diamond Lake Road; Mrs. John W. MacDonald, 6633 Parkwood Road; Mrs. B. D. Mitchell, 641 So. Westwood Drive; Mrs. Mancel Mitchell, 4613 Browndale; Mrs. Malvin Nydahl, Willow Creek, Hopkins; Mrs. L. J. Petit, 6305 Russell Ave. So.; Mrs. Frederick H. K. Schaaf, 1238 W. Minnehaha Parkway; Mrs. Lewis Sher, 3941 Washburn Ave. So.; and Mrs. Wesley Spink, 1916 E. River Terrace.

Mrs. Emerson E. Hoppes, telephone and area chairman, was in charge of general arrangements.

* * *

Members of the Woman's Auxiliary to the Hennepin County Medical Society were extended invitations by the Hennepin County Dental Auxiliary to be their guests at a tea and joint meeting on February 9 at the Prudential Life Insurance Building.

The program was highlighted by discussion on the topic "How peoples of the World could get along Together in Peace." Taking part in this panel were: The Reverend Morris G. Robinson of Grace Presbyterian Church who discussed the topic from the religious aspect, The Rabbi Stanley Rabinowitz from Adath Jeshurun Synagogue who discussed the political aspect and Mr. Graham Hovey of the Minneapolis *Star* and *Tribune* who discussed the economic aspect. Mrs. D. R. Clark was the moderator.

RAMSEY COUNTY MEDICAL AUXILIARY SHOWS CANCER FILM

"The Other City," an American Cancer Society film, was shown at a meeting of the Woman's Auxiliary to the Ramsey County Medical Society in Coleman's Highland Village restaurant. At the meeting, Mrs. Louis L. Friedman, auxiliary representative to the Ramsey County Tuberculosis and Health Association presented the annual awards to high school essay contest winners. Mrs. Wallace A. Gleason is auxiliary representative to the Cancer Society.

While the tuberculosis problem in this country may be shrinking somewhat, the total field of lung diseases is enlarging with the aging of the population, reports the National Tuberculosis Association.—*Christmas Seal Health News.*



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para-aminobenzoate .....0.3 Gm. (5 gr.)
corbic acid .....50.0 mg.

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Ascorbic acid .....50.0 mg.

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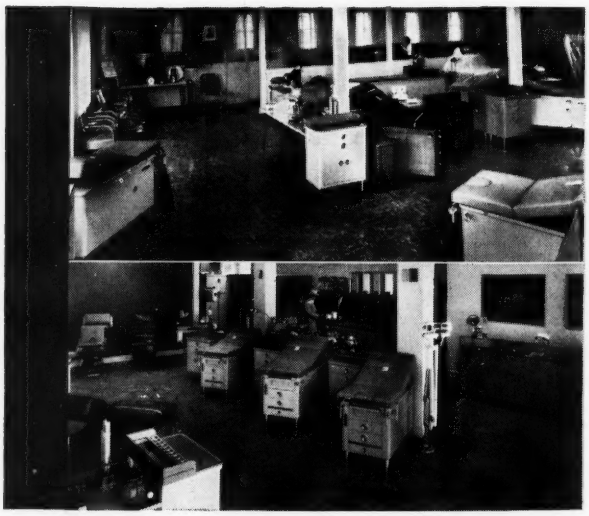
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Thiamine HCl (B_1)	10 mg.
Pyridoxine HCl (B_6)	5 mg.
Ferric Pyrophosphate (Soluble)	250 mg.
Iron (as Ferric Pyrophosphate)	30 mg.
Sorbitol	3.5 Gm.

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General Interest

Dr. John R. Watson, physician in the Olmsted Medical Group, has been elected chief of staff of the Olmsted Community Hospital. He succeeds **Dr. N. J. O'Keefe** of Spring Valley. Terms of the office are for one year. Additional new officers are **Dr. S. K. McHutchison** of St. Charles, vice president, and **Dr. John Brodhun** of Rochester, secretary-treasurer.

* * *

The Mayo Clinic has announced the names of four present assistants to the staff who became members of the staff at the beginning of the new quarter which began January 1. They are **Drs. Edgar C. Harrison, Jr., Lowell F. A. Peterson, Charles J. Restall,** and **Richard M. Steinhilber.** Dr. Harrison will join the surgical pathology section. Dr. Peterson will be a consultant in orthopedic surgery. Dr. Restall will be a consultant in anesthesiology, and Dr. Steinhilber will be a consultant in psychiatry.

* * *

Six Mankato doctors have been named to the medical advisory board of the Mankato Rehabilitation Center by William Edwards, president of the board of directors of the center. They are **Drs. Paul H. Gislason,** orthopedist and medical director; **John J. Eustermann,** internist; **William S. Chalgren,** neuro-psychiatrist; **Herbert Huffington,** general practitioner; **Howard R. Snider,** surgeon, and **Donald B. Swenson,** pediatrician.

* * *

Fellows in the Mayo Foundation who received degrees from the Graduate School of the University of Minnesota at commencement exercises included: **Dr. William Manger,** a Ph.D. in Medicine. The following received Master of Science degrees in various categories. Medicine—**Drs. Barry Decker, Robert Fontana, William L. Hedrick, Robert A. Kyle, Raymond L. Newnum, Altan Onat, Patrick A. Ragen, Cynthia A. Stoltze** and **A. Paul Vastola;** surgery—**Drs. Dennis C. Higgins, Robert B. Edelmann** and **Donald F. Phillips;** dermatology—**Drs. Troy G. Rollins** and **Herman J. Schultz;** neurology—**Dr. Edward V. S. Spudis;** neurosurgery—**Dr. Henry E. Storino;** obstetrics and gynecology—**Dr. Herbert K. Beutler;** ophthalmology—**Dr. Martin S. Kazdan;** pathology—**Dr. Thor M. Thorgersen;** proctology—**Dr. Robert J. Spencer,** and in radiology—**Drs. Charles W. Vickers** and **Mark H. Wholey.**

* * *

The new president of the medical staff at Minneapolis' Abbott Hospital is **Dr. Lane Arey.** He succeeds **Dr. John T. Pewters** who held this office the past two years. Other officers elected are **Dr. N. C. Plimpton,** vice president; and **Dr. A. Boyd Thomes,** secretary-treasurer. Those elected to the executive committee are **Drs. M. C. McCannel, W. W. Rieke, Elizabeth Lowry** and **F. J. McCaffrey.**

The staff of St. Mary's Hospital, Minneapolis, recently gave a dinner in honor of **Dr. Horatio B. Sweetser,** retiring president of the Minnesota State Medical Association.

* * *

Dr. Kenneth W. Covey, who for eleven years conducted a general practice at Mahnomen, has announced that he will be associated with the Northwestern Clinic, Crookston, after the middle of January. He recently finished a three-year residency in orthopedics at the Mayo Clinic.

* * *

A Mayo Clinic physician and former associate director of the Mayo Foundation, **Dr. Raymond D. Pruitt,** has been named to the state and district selection committee for the Rhodes Scholarship.

* * *

Dr. John E. Verby, Rochester, was elected president of the Olmsted Medical Group at the annual partnership meeting in the University Club of the Kahler Hotel. He succeeds **Dr. Harry E. Burich** of Rochester. Other new officers are **Dr. John R. Watson,** vice president; and **Dr. William R. Weyhrauch,** secretary-treasurer. Eight physicians comprise the partnership. In addition to the officers, other partners are **Drs. H. A. Wente, James R. Doyle, John C. Brodhun** and **Malcolm K. Campbell.** Associated in practice, but not partners, are **Drs. Mary Pougiales, Lloyd T. Wood, John Fluegel** and **John Garman.**

* * *

The medical staff at St. Mary's Hospital, Lake Park, recently elected **Dr. A. J. Houglum,** Lake Park, as secretary-treasurer of the group. **Dr. L. H. Rutledge,** Detroit Lakes, was elected as its president. **Dr. Virgil A. Watson,** Detroit Lakes, was elected vice-president.

* * *

Dr. Robert R. Kierland of the Mayo Clinic has been re-elected secretary-treasurer of the American Academy of Dermatology and Syphilology.

* * *

Dr. C. Walter Lillehei, professor of surgery at the University of Minnesota Medical school, is now an honorary member of the International Medical club, it has been announced. Dr. Lillehei accepted the honor, with an honorarium of $100, for his accomplishments in the field of cardiovascular surgery at the annual meeting of the American Association for the Advancement of Science in Washington, D. C.

* * *

A Buffalo Lake physician, **Dr. Donald Metz,** has opened his office in Stewart.

(Continued on page A-64)

AN EXPERIMENT IN MEDICAL NOMENCLATURE INTRODUCING THE TERM:

"cell examination for uterine cancer"



The exfoliative cytological examination is called by some doctors the *cytologic cervical test*—by others the *"Pap" smear test.* In urging all women to have this test annually, we are calling it the *cell examination for uterine cancer.*

Here are our reasons:

Cytologic cervical test is a term which seems complicated to many women.

"Pap" smear test is simple, but women we have talked to find the word "smear" unpleasant and disturbing, and it may add to their anxieties about pelvic examinations.

Public relations advisors say that broadcasters and editors will dislike "smear"— and TV, radio and the press will be essential to the success of this educational project.

We have considered other terms but have at last agreed on *cell examination for uterine cancer* as the term which simply and accurately describes the keystone of this vitally important program.

This test can help save thousands of women each year. In many parts of the country it is becoming widely accepted as a part of a routine checkup. As fast as county medical societies approve, our local Units will urge women to go to their physicians annually for a *cell examination for uterine cancer.*

AMERICAN CANCER SOCIETY

(Continued from page A-62)

Newly returned from a 35,000-mile global trip as a lecturer for the International College of Surgeons, **Dr. Winchell McK. Craig** has left on a trip to Cairo, Egypt, by way of London and Naples. Dr. Craig will make the trip as a member of an official delegation named to represent the United States Navy at the tenth anniversary celebration of the founding of the Naval Medical Research Unit in Cairo. Established for the study of tropical diseases, the unit is maintained by the Navy at Cairo and staffed by medical officers.

On his recent tour with a delegation representing the International College of Surgeons, he was in Hawaii, Japan, Hong Kong, the Philippines, Thailand, India, Egypt, Turkey, Greece, Italy and Spain. He was one of six lecturers in a 28-member group, which met with local chapters of the international organization. His trip included lectures to medical students, schools and societies. On his forthcoming trip, Dr. Craig will appear at a meeting of the Medical Society of Egypt. The meeting is arranged by the Egyptian Ministry of Health.

* * *

A new associate of the Chisago Lakes Clinic is **Dr. William H. Thomas**, Howard Lake.

* * *

Dr. J. J. Heimark, Mankato, was elected president of the Immanuel Hospital medical staff at a recent meeting of the staff. He will serve through 1959. Other new officers elected were **Dr. E. E. Heller**, vice president; **Dr. J. B. Lund**, secretary-treasurer; and **Drs. M. W. Dobson, H. J. Smith and H. R. Snider** to the executive committee.

* * *

Willmar's oldest practicing physician, **Dr. Jno. C. Jacobs**, has retired after fifty-two years in the practice of medicine in that area. He is eighty years old.

* * *

Dr. Leo Furr has become associated with **Drs. H. P. Hinderaker** and **D. G. Alton**, Bird Island. Dr. Alton will leave Bird Island the first of March to join a three-man medical group in St. Paul.

* * *

Dr. Victor Johnson, director of the Mayo Foundation, attended the 55th annual Congress on Medical Education and Licensure, February 7-10, in Chicago.

* * *

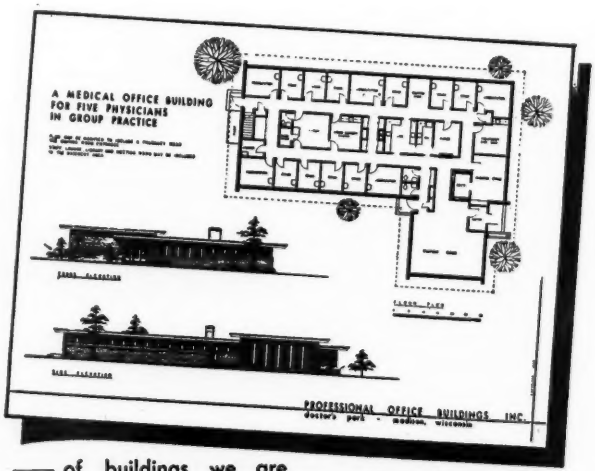
Dr. Cecil J. Watson, head of the University of Minnesota Medical School's department of medicine, has received a "distinguished service" award from *Modern Medicine*, national medical publication, it has been announced. In the citation, Dr. Watson was specifically honored for "his additions to clinical knowledge of liver function and the clarification of porphyrin metabolism." Porphyrins constitute a key group of compounds for the existence of life. Dr. Watson has been active in this research field since 1931.

(Continued on page A-66)

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(Continued from page A-64)

The physician at the Minnesota School for the Deaf at Faribault has announced his retirement after completing twenty-seven years of service to that institution. He is **Dr. Charles M. Robilliard** of Faribault.

* * *

The importance of the bloodmobile and the necessity of having blood on hand at all times was the topic discussed by **Dr. R. Wayne Taintor,** Marshall, featured speaker at a recent meeting of the Marshall Rotary Club.

* * *

Emeritus head of the Mayo Clinic's section of Neurology and psychiatry, **Dr. Henry E. Woltman** recently returned from a month-long trip to Russia.

* * *

A third doctor, **Dr. W. C. Ferguson,** Walnut Grove, recently began using the facilities at Schmidt Memorial Hospital of Westbrook.

* * *

Dr. C. Allen Good, Mayo Clinic physician, attended a meeting of the American Roentgen Ray Society, recently, in Cincinnati, Ohio. Dr. Good is secretary of the society and a member of its program committee.

* * *

A talk by an Iron Range physician highlighted a meeting of the Lake Superior Mines Safety Council in Virginia. **Dr. J. R. Chittum,** East Range Clinics, Hoyt Lakes, discussed "The Medical Relationship to a Safety Program."

* * *

Dr. Robert W. Hollenhorst, a member of the Section of Ophthalmology of the Mayo Clinic since 1949, has been appointed chairman of the Committee on Ophthalmology of the Minnesota State Medical Association and a member of the Committee on Industrial Health of the state association. Dr. Hollenhorst is assistant professor of ophthalmology in the Mayo Foundation.

* * *

Dr. Frederick A. Figi and **Dr. J. L. Juergens,** Rochester, were recent participants in the program of the Southeastern regional meeting of the International College of Surgeons held in Miami Beach, Florida.

* * *

Dr. William Sawyer Eisenstadt, Minneapolis, attended the Third International Congress of Allergy at Paris, France, October 19 through October 26. He presented the paper, "Goiter and Myxedema from Prolonged Iodide Ingestion."

* * *

Honored recently with the distinguished award of the Minnesota Education Association was a sixty-five-year-old Austin physician who has served on his local school board for seventeen years. **Dr. Peter A. Lommen** received the award, given annually to a Minnesota

(Continued on page A-70)

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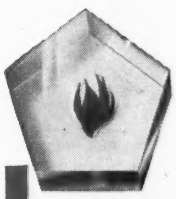
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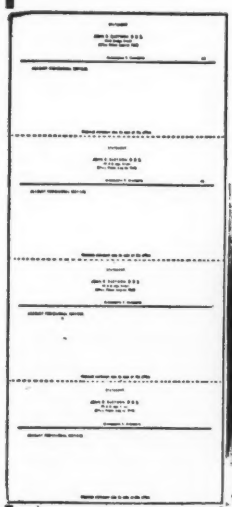
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(Continued from page A-66)

school board member, at a dinner of the Minnesota School Board Association's Annual Convention in Hotel Lowry. Dr. Lommen, active in community and civic affairs in Austin since establishing his practice there in 1920, was cited for his leadership in school affairs and his "quest for quality teaching."

* * *

New officers were elected recently by the medical staffs of both Union Hospital and Loretto Hospitals of New Ulm. **Dr. Frank J. Carthey** was elected president of the Union staff. Other officers are **Dr. W. J. Muesing,** vice president; and **Dr. J. W. Burnett,** secretary. At the Loretto Hospital, **Dr. M. L. Kaiser** was named president for 1959. Other officers are **Dr. J. B. Schroeppel,** Winthrop, vice president, and **Dr. W. J. Muesing,** secretary.

* * *

A Hibbing physician, **Dr. Donald Nollet**, was one of six Minnesotans to receive the 1958 Contact Award for outstanding service to Catholic youth. The presentation was made by His Excellency Bishop Laurence Glenn.

* * *

Dr. Ray A. Johnson, formerly of Breckenridge, recently joined the Park Region Medical Center at Fergus Falls. Before coming to Fergus Falls, Dr. Johnson spent two years in Germany with the U. S. Army Medical Corps.

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Book Reviews

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

TRIFLUOPERAZINE — Clinical and Pharmacological Aspects. Henry Brill, M.D. Assistant Commissioner, New York State Department of Mental Hygiene, Albany, New York. 219 pages. Illus. Price $3.50, cloth. Philadelphia: Lea & Febiger, 1958.

APPLIED MEDICAL LIBRARY PRACTICE. Thomas E. Keys, A.B., M.A. Librarian of the Mayo Clinic, Rochester, Minnesota; Assistant Professor of History of Medicine, Mayo Foundation Graduate School, University of Minnesota. With chapters by Catherine Kennedy, B.S., L.S., Associate Librarian Mayo Clinic, and Ruth M. Tews, B.S., L.S., Hospital Librarian, Mayo Clinic. 495 pages. Illus. Price $10.75, cloth. Springfield, Illinois: Charles C Thomas, 1958.

PHYSICAL DIAGNOSIS. The History and Examination of the Patient. John A. Prior, M.D., Professor of Medicine, Ohio State University College of Medicine, Columbus, and Jack S. Silberstein, M.D., Clinical Associate Professor of Medicine, Ohio State University College of Medicine, Columbus. 388 pages. Illus. Price $7.50, cloth. St. Louis: The C. V. Mosby Co., 1959.

VIRAL AND RICKETTSIAL INFECTIONS OF MAN. Third Edition. Edited by Thomas M. Rivers, M.D., Member Emeritus, The Rockefeller Institute; Vice President, Medical Affairs, The National Foundation; and Frank L. Horsfall, Jr., M.D., Vice President for Clinical Studies, Physician-in-Chief to the Hospital, Rockefeller Institute. 967 pages. Illus. Price $8.50 cloth. Philadelphia: J. B. Lippincott Co., 1959.

PRACTICAL LEADS TO PUZZLING DIAGNOSES. By Walter C. Alvarez, M.D., D.Sc. 490 pages. Price $9.00. Philadelphia: J. B. Lippincott Co., 1958.

Dr. Alvarez anticipates the criticism that may be directed towards his newest book because of the informal nature in which he presents his material.

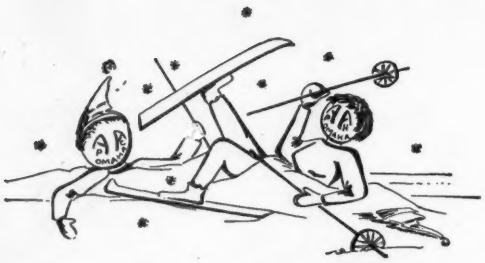
It is the informal method in presenting the material that makes this book attractive. His wide clinical experience and understanding of the functionally ill patient is evident throughout this book. His suggestions concerning diagnosis and his weight of the handling of these patients makes this book most valuable. This book may be recommended to all physicians for its pleasant style and its ease of reading as well as for its valuable suggestions in the diagnosis and handling of this type of patient.

JOHN F. BRIGGS, M.D.

THE CARE OF THE GERIATRIC PATIENT. Edited by E. V. Cowdry, Ph.D., Sc.D. (Honorary). 438 pages. Price, $8.00. St. Louis: The C. V. Mosby Company, 1958.

The impressive list of contributors to this volume emphasizes the importance of this expanding field of medicine, geriatrics. Mr. Bernard M. Baruch rightly has stated that the recent prolongation of life has more implications now and in the future than most any other advancement of knowledge in a field. This book carries out the command of Drs. Piersol and Bortz who some





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years ago said, "It is for science not only to add years to life, but more important, to add life to years."

The field of geriatrics may become a full-fledged specialty in the future. The training is hard to receive at this time and often physicians are called upon to expand their knowledge to include the present fundamental principles in this new field of caring for old people. These fundamentals are included in the text edited by Dr. Cowdry.

The section on cancer detection is built around our own Minnesota cancer detection program. This reflects one of the many facets of the geriatric problem which is moving forward rapidly in our own state.

A section stressing the importance of weight reduction in the obese geriatric patient is too short for its relative importance in patient care. A checklist for laboratory tests to be carried out at various intervals is valuable to the busy practitioner and might well be duplicated and placed on the chart of every patient past fifty years of age.

The mental aspects of the elderly patient are amply discussed. With the increasing number of elderly patients left in hospitals, a plea is made to indoctrinate the public and the medical profession with the concept that many older patients can be treated and sent home in a relatively short period of time.

A section of the textbook on differences in surgical techniques and anesthetics to be used in geriatric patients is helpful, to say the least.

DONALD W. KOZA, M.D.

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Probenecid (Benemid) in the Treatment of Gout and Gouty Arthritis

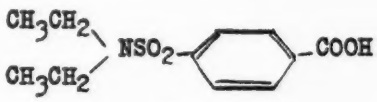
• *A number of additions to the drug therapy of gout have been reported in recent years. The author reviews the mechanism of action of one of these, probenecid, Benemid®) and outlines the practical rules he has followed in the management of his patients with gout. In discussing his results he classifies his cases into acute and chronic phases, both of which can be effectively treated.*

FRED A. RICE, M.D.
Minneapolis, Minnesota

PROBENECID (Benemid®) was developed in a search for a more effective agent than caronamide to inhibit renal excretion of penicillin.[1] It is structurally similar to caronamide and similar in many of its actions.[2]



Caronamide



Probenecid

Thus Wolfson's observation that caronamide was an effective uricosuric agent[3] was soon shown to be true of Benemid[4], and the latter is now used chiefly in the treatment of chronic gouty arthritis and the prevention of acute gout.

In addition to promoting an increased excretion of uric acid, Benemid causes a loss of phosphate in the urine. This effect has been useful in treating familial nephrogenic osteopathy and in controlling the tetany of hypoparathyroidism.[1] However, Gutman *et al*[5] did not find evidence of significant

Benemid® is a product of Merck Sharpe & Dohme, Division of Merck & Company, Inc., Philadelphia, Pennsylvania.

twenty-four-hour loss of phosphate, sodium, potassium, chloride or water, although there was an increased two-hour clearance of both sodium and chloride. Loss of sodium and water in patients

TABLE I. SIDE-EFFECTS IN 2502 PATIENTS[1]

Side-Effect		Number	Per Cent
Gastrointestinal		78	3.1
Anorexia	2		
Nausea	25		
Vomiting	6		
Diarrhea	1		
Gastrointestinal upset	40		
Abdominal discomfort	2		
Burning	2		
Hypersensitivity		8	0.31
Drug fever		9	0.36
Rash		34	1.35
Renal colic		17	0.68
Costal vertebral angle		2	0.08
Hematuria		2	0.08
Acute gout		31	1.20
Flushing		1	0.04
Reducing substance in urine		14	0.55
Dizziness		1	0.04
Anemia		1	0.04
Non-protein nitrogen elevation		3	0.12
Headache		Occasional	
Total		175	7.94

with congestive heart failure is significant.[6] The excretion of penicillin and para-aminosalicylic acid (PAS) is lessened with an increase in the penicillin levels in serum of 100 to 1100 per cent and in the PAS levels of 15 to 30 per cent. Other antibiotics, sulfonamides and salicylates are not affected.[7]

The increased excretion of uric acid as a result of Benemid administration is due to inhibition of the tubular reabsorption of uric acid.[8] Sirota, Gutman and Yu[5] found an increased urate clearance of about four-fold, with no change in glomerular filtration rate, and a 46 to 67 per cent increase in the urate excretion, depending on the dose of Benemid. Pascale *et al*[9] found the initial increase in urate excretion, with normal renal function, to range from 35 to 200 per cent. Of particular interest is a case of Fanconi's Syndrome reported by Sirota *et al*[5] in which there was no increased urate excretion following Benemid. Apparently the defects in the proximal tubule included failure to reabsorb uric acid, and no further blocking effect could be obtained.

With the increase in the excretion of uric acid, the serum levels fall and the miscible pool of uric acid is substantially reduced.[10] Within three days the serum urate falls sharply, averaging about 45 per cent. This sharp fall is not sustained, however, and the fall over a period of several weeks averages about 32 per cent.[11] Bishop, Rand and Talbott[10] found a marked drop in the miscible pool of uric acid in two patients. In the patient with gout, the pool fell from 2205 mg. to 1622 mg. on 2 gm. of Benemid daily, and in a hyperuricemic normal individual from 964 mg. to 466 mg. The increased excretion of uric acid continues as long as Benemid is taken[12] as does the reduction in metabolic pool. If renal insufficiency is sufficiently advanced there may be no increase in urate excretion.[9]

This loss of uric acid is reflected in the clinical course of chronic gouty arthritis with lessening of pain and stiffness, the return of a feeling of well-being, failure of new tophi to develop or those already present to enlarge and, in a few cases, healing of draining sinuses, and shrinking of tophi already present. Radiographic changes may improve slightly.[13] Improved kidney function may occur.[14]

Gutman and Yu[13] reported on the course of thirty patients followed for eight months to four years. Thirty per cent failed to achieve normal uric acid levels, either because of poor kidney function, poor patient co-operation or failure of Benemid in a dose of 3.0 gm. per day. Of twenty-three patients with tophi, almost half (eleven) showed definite or marked improvement, nine were slightly better, and only three showed no change. None showed new tophi or an increase in size of already present tophi. Two of three sinuses healed, and there was a slight improvement in the x-ray appearance of involved bones in a few cases. Pascale[9] noted improvement in joint motion in all cases with impairment.

Acute gout may be temporarily aggravated by Benemid, the mobilization of uric acid seeming to act to precipitate attacks. For this reason many authorities use Colchicine routinely in starting Benemid therapy.[15] If an attack occurs it can be treated with Colchicine, as usual. As Benemid is continued, the attacks of acute gout usually become less severe and less frequent and often are completely absent after several months of therapy.[13]

Benemid is rapidly absorbed following oral administration with measurable amounts appearing in the plasma within one-half hour after a 0.5 gm. dose, and significant concentrations lasting for as long as twenty-four hours after a 1.0 gm. dose.[7] There is apparently no degradation of Benemid in the body and elimination is through glomerular filtration as a glucuronic acid complex.[16] In the normal man, a dose of 2 gm. per day will yield a

TABLE II. RESULTS IN TREATING FIFTEEN PATIENTS

Case No.	Age Onset	Sex	Duration Before Benemid	Symptoms	Maintenance Dose	Uric Acid Before	One Month	Latest	Duration Treatment	Result
1. H.P.	35	M	23 years	1 acute/year	1.0	10.2	7.2	5.1	4 years	Excellent.
2. L.M.	65	M	2 years	1 acute/year	1.5	7.6	6.9	6.3	3 years	Excellent. Gout in first month of treatment.
3. R.F.	29	M	8 years	4 acute/year	2.0	9.2	6.0		3 weeks	Stopped voluntarily.
					0.5	10.8			2 weeks	Acute gout.
					0.5	6.8			1 week	Rash.
4. A.M.	62	M	18 years	1 acute/2 years	1.0	9.3	6.6	6.2	1 year	Good. Gouty arthritis between courses.
						11.4		4.3	1 year	
5. G.C.	55	M	1 year	Several acute attacks in 1 year	2.0	9.0	6.0		1 month	
6. R.M.	50	F	25 years	1 acute/year	0.5	6.6	6.3	6.3	2 months	Died congestive failure. Gout 2 months after starting second course.
						9.1			2 years	
7. C.M.	48	M	15 years	Chronic chest pain, elbows, fingers, knees	0.5	7.4		6.8	6 months	Good while taking medicine.
					0.5	8.0	6.7		1 year?	
					0.5	7.7				
8. E.P.	35	M	15 years	Chronic chest pain	1.0	9.9	7.8	5.0	3 years	Excellent.
9. J.T.	43	M	11 years	Chronic pain feet, ankles, chest and arms	1.0	7.9	6.9	5.3	2 years	Excellent while taking Benemid.
					0.5	8.0		6.1	1 year	
10. M.B.	64	M	15 years	Pain elbows, wrists, fingers, ankles and chest	0.5	7.4	5.7	4.0	1 year	Good.
11. C.E.	47	M	1 year	Chronic pain ankles and knees, small tophus	1.0	8.8	6.2		1 month	
12. C.V.	65	M	6 years	Pain knees, elbows	0.5	6.8	6.4		6 weeks	Died second coronary.
13. R.H.	40	F	22 years	Swelling and pain fingers, shoulders, left knee	0.5	6.7	4.9	5.5	3 years	Dramatic improvement in fingers.
14. L.Ma.	55	F	6 months	Knees	1.0	7.0	4.8		1 month	
15. E.K.	36	F	3 years	Knees	1.0	8.5	5.1	5.1	6 months	Good.

plasma level of 4 mg. per cent.[7] Doses in excess of this amount may cause a slow increase in the plasma concentration to the point of intoxication, with nausea and vomiting on the basis of intoxication of the central nervous system appearing at about the 30 mg. per cent level.[1] With impaired kidney function, lesser amounts may be excessive. The effective dose varies from 0.5 to 4 gm. daily.[17]

Gutman and Yu[13] report that 60 per cent of patients can be managed on 0.5 to 1.0 gm. daily, another 25 per cent on 1.5 to 2.0 gm. daily, and 15 per cent on 2.5 to 3.0 gm. daily. They did not use doses above 3.0 gm. daily, and other authorities[18,19] feel that doses over 2.0 gm. daily are rarely indicated.

Side-reactions in a series of 2,502 cases collected from the literature or observed personally by Boger and Strickland[1] are shown in Table I. Many of these patients were treated with Benemid only for a few days or weeks. In other series in which Benemid was given for longer periods of time, reactions were slightly more frequent but the various series are not strictly comparable. Apparently reactions of sufficient severity to necessitate stopping treatment occurred in 2 to 12 per cent[13,18] of cases.

Certain of the side-reactions are due to the physiologic effect of Benemid, with a large outpouring of uric acid into the urine, and precipitation of uric acid once the saturation point is exceeded. Among these are the passage of urate calculi and urate gravel, and the occurrence of hematuria, presumably from crystal and calculus irritation. Talbott[19] notes that urinary frequency is common but not troublesome. This may be related to increased acidity of the urine, but is apparently not usually due to urate gravel or calculi.

These side-effects can be avoided by starting treatment with small doses of Benemid during the first week so that large amounts of uric acid are not excreted immediately. An increased fluid intake helps to lower the uric acid concentration in the urine, and alkalinization of the urine increases the solubility of the uric acid.

Another apparently physiologic side-reaction is the presence of a reducing substance in the urine of a few patients taking Benemid. This reducing substance is thought to be the glucuronic acid which is excreted into the urine in conjugation with Benemid.

The gastrointestinal effects seem to depend on dosage since Boger and Strickland[1] report that all of ninety-one patients given 3 gms. per day developed distress. In nearly all cases of gastrointestinal irritation reported, a reduction in dose was sufficient to stop the symptoms. In a few cases Benemid had to be discontinued.

The hypersensitivity reactions have not been severe and have not been more frequent on prolonged administration. As with other drugs, intermittent courses at times seem related to development of idiosyncrasy.[1] Hypersensitivity reactions have included rashes, sore throat and fever. Marson[11] reported one case in which sweating, head-

ache and unconsciousness developed shortly after administration. The white blood count has not been reported to be affected.

The present series (Table II) consists of six patients with recurrent acute gout and nine patients with chronic gouty arthritis treated with Benemid for varying periods up to four years. Another six patients were given Benemid but are not included in the series—either because of inadequate follow-up or doubt as to the accuracy of the diagnosis. (None of these had any adverse reaction from Benemid.) In general, the response has been very satisfactory.

The patients with acute gout (Cases 1-6, Table II) were five men and one woman ranging in ages from twenty-nine to sixty-five years at the time of the first attack.

The frequency of attacks was extremely variable ranging from one episode every two years to four attacks per year. The great toes were most frequently involved, but the ankles, knees, wrists and hands were also the site of acute gout. Three of these patients had some gouty arthritis in the intervals between attacks but did not find the interval symptoms particularly troublesome.

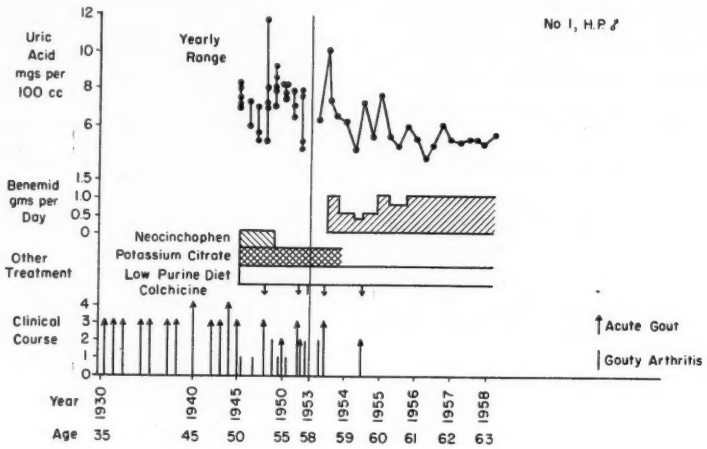


Fig. 1. Case 1 (H. P.).

Case Report

Case 1.—H. P., a white man, was first seen in 1945 with a history of gout starting in 1930 when he was thirty-five years old. He had missed having attacks only four years out of the fifteen. His attacks occurred almost always in the right great toe and in the month of March. In addition to the toe, the ankles and knees had been involved. The attacks had gradually increased in duration and in the four years prior to his first visit he had been hospitalized at the Minneapolis Veterans Administration Hospital seventy-five days in 1940 and 100 days in 1944 because of gout. In between the attacks he had had no symptoms.

His initial treatment consisted of a low purine diet; Neocinchophen, 2 gm. a day three days each week; and potassium citrate, 6 gm. a day. On this program he did very well until December, 1948, when he developed acute gout, chiefly in the right ankle, which responded promptly to Colchicine. In April, 1949, he had pain and stiffness in the right elbow for a few weeks. The Neocinchophen was discontinued in June, 1949. In September, 1950, he had a moderate attack of gout in the left great toe. In May, 1952, he had acute gout, responding promptly to Colchicine, followed by a mild attack in November, 1952. In April, 1953, he was having pain in the left knee, elbow and great toe and in May, 1953, he again had acute gout, first in the right knee, later in the right foot which again cleared promptly on Colchicine.

In July, 1953, his serum uric acid was 10.2 mg. per cent and he was started on Benemid, 0.5 gm. daily for the first week, then 1.0 gm. daily. In October, 1953, the dose of Benemid was reduced to 0.5 gm. daily (uric acid 6.4 mg. per cent) and in December, 1953, the potassium citrate was discontinued. In April, 1954, the uric acid was 4.5 mg. per cent and the Benemid was reduced to five 0.5 gm. doses a week, but on June 11, 1954, he developed acute pain, redness and swelling in the left little toe with a uric acid of 7.1 mg. per cent. The Benemid was raised to 0.5 gm. daily and he was given Colchicine with prompt relief. The uric acid remained high (7.6 mg. per cent) so in December, 1954, he was given 1.0 gm. daily of Benemid. In March, 1955, the uric acid was 5.3 mg. per cent and the Benemid was reduced to 0.75 gm. daily. The uric acid level rose slightly (5.8 mg. per cent) and he resumed taking 1 gm. Benemid daily in September, 1955, which he has

continued since that time, with uric acid levels from 4.0 to 6.0 mg. per cent. He has been completely free of symptoms since June, 1954.

In the nine patients with chronic gouty arthritis (Cases 7-15) there were six men and three women with the age at onset ranging from thirty-six to sixty-five years. All of these patients had a history of insidious onset of arthritis. None gave a history typical for acute gout prior to onset of arthritis, although three patients (Cases 9, 10 and 12) had had unexplained joint pain before definite arthritis appeared.

The arthritis followed the distribution of osteoarthritis, involving usually the back, knees, fingers, shoulders and hips. The arthritis was at times remitting, at other times was quite constant, and usually was not accompanied by heat, redness or swelling of the involved joints.

Of particular interest was the prominence of chest pain among these patients. In two (Cases 7 and 8) it was the chief complaint, and in two other patients (Cases 9 and 10) it had been present for many years, antedating the development of other symptoms which eventually led to the diagnosis of gout.

Case Report

Case 13. R. H., a white woman, was first seen in 1946. At this time she stated that she had had arthritis for fifteen years beginning in 1931 when she was forty years old, involving chiefly the hands and elbows. A diagnosis of gouty arthritis had been made about 1941. In the fall of 1946 she had a two-week to three-week period of swelling, pain and redness in the thumb and fifth finger on the right hand. She was given a low purine diet, Neocinchophen and potassium citrate, but experienced no relief of symptoms. Her fingers continued to be red and swollen nearly all of the time. Throughout the summer of 1947 the right hand was painful and continued to be painful during 1948. During the next five years she continued to have remissions and exacerbations of the gouty arthritis in her fingers, with slowly increasing deformity of the fingers and gradual involvement of the fingers of the left hand.

In 1953, she developed pain in the right knee. In March, 1954 she was started on Benemid, 0.5 gm. daily. Her uric acid was 6.4 mg. per cent. Within a week there was marked improvement. After one month the fingers were normal in color, 50 per cent less swollen, and the uric acid was 4.9 mg. per cent. However, in December, 1954 there was a flareup of the gouty arthritis in the middle finger of the left hand, which persisted for several months. In April, 1956, after stopping Benemid for three weeks, she had redness and swelling of the left sterno-clavicular joint and pain in the shoulders and hands. In April, 1957 she had no arthritic symptoms and her uric acid was 5.5 mg. per cent.

The effect of Benemid was good to excellent in fifteen of the sixteen cases as far as relief of symptoms was concerned. In Case 3, the patient was unwilling to follow any consistent plan of treatment, although he showed a good fall in uric acid in his first course. His second course of treatment appeared to precipitate an attack of gout at the end of the second week, and his third course was followed by itching and a rash one week after starting. In Case 2, acute gout occurred shortly after starting treatment. This attack was precipitated by confinement to bed because of acute epididymitis four weeks after starting Benemid. In Case 1, a mild attack occurred when the maintenance dose was reduced too much. In Case 6, an acute attack occurred six weeks after starting a second course of Benemid (0.5 gm. per day). This was probably due to the omission of Benemid, rather than any "flooding" of the body with freshly mobilized uric acid, for she had previously tolerated 1.0 gm. daily very well. In Cases 2, 4 and 6 an increase in aching and stiffness was noted when medication was not taken regularly. Proper adjustment of the dose and regular adherence to it have resulted in freedom from acute gout in each instance. The fifth patient has been under treatment too short a time to know whether his acute attacks will be prevented.

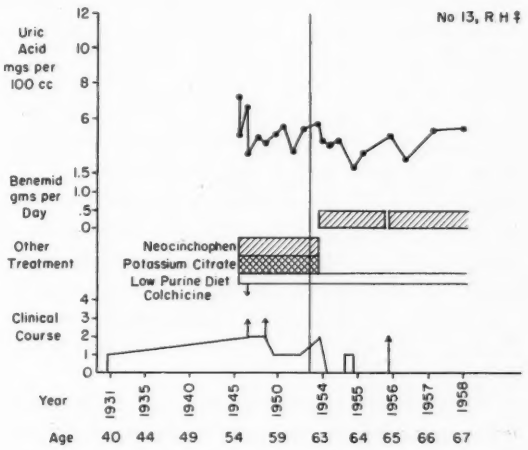


Fig. 2. Case 13 (R.H.).

All of the patients with chronic gouty arthritis have experienced sustained relief of symptoms as long as they followed the prescribed program, although three of the nine are not completely free of stiffness and aching.

In these patients the main problem has been maintenance of treatment. The less disabling symptoms have not offered as great an incentive for following the treatment program faithfully. Two patients (Cases 8 and 13), who were almost disabled by chronic gouty arthritis, have had prompt relief of their major symptoms and have followed the treatment program faithfully.

The serum uric acid levels decreased promptly in all cases, and remained so in all but one case. An attempt has been made to adjust the dose of Benemid to keep the uric acid within the normal range (4.0 to 6.0 mg. per cent in our laboratory). In Case 2, there was dramatic persistent symptomatic improvement, yet uric acid levels fluctuated, sometimes going almost as high as when treatment was started. Increasing the maintenance dose of Benemid has reduced the serum uric acid satisfactorily.

The average uric acid concentration in the blood prior to starting treatment (not including the third course in Case 3) was 8.4 mg. per cent (range 6.6 to 11.4), after one month of treatment was 6.2 mg. (range 4.8 to 7.8), and when last determined was 5.3 mg. (range 4.0 to 6.3) in those patients followed beyond the first month.

Only in Case 3 were there side-effects from Benemid. This is perhaps related to the relatively small doses used and the gradual introduction of therapy. Usually treatment was started with 0.5 gm. Benemid daily for two weeks and then 1.0 gm. daily until the patient was next seen. If the uric acid showed a satisfactory fall, the dose was reduced to 0.5 gm. daily, unless later uric acid determinations showed a need for larger doses of Benemid. At present, four patients are taking 0.5 gm. daily; eight are taking 1.0 gm.; one, 1.5 grams and one, 2.0 grams. The two who died were on 0.5 gm. at the time of death. Of the six patients who took 0.5 gm. per day four did not achieve normal uric acid levels and it is likely that the proper maintenance dose for the two of the four who are still living will prove to be 1.0 gm. daily.

Summary

1. Benemid has been found to be a safe and effective agent for the treatment of chronic gouty arthritis and the prevention of acute gout.

2. A series of six patients with recurrent acute gout and nine patients with chronic gouty arthritis treated with Benemid for periods up to four years is reported.

3. In one case treatment had to be discontinued because of a possible drug rash.

4. In all patients who followed the recommended program, the uric acid was brought to normal or near-normal levels and the symptoms were markedly alleviated.

References

1. Boger, W. P. and Strickland, S. C.: Probenecid (Benemid): its uses and side effects in 2,502 patients. A.M.A. Arch. Int. Med., 95:83, 1955.
2. Gutman, A. B.: Some recent Advances in the study of uric acid metabolism and gout. Bull. New York Acad. Med., 27:144, 1951.
3. Wolfson, W. Q., Cohen, C., Levine R. and Huddlestun, B.: Physiologic significance of the uricosuric effect of caronamide. Am. J. Med., 4:774, 1948.
4. Gutman, A. B.: Uric Acid Metabolism and Gout. *In* Combined Staff Clinic. Am. J. Med., 9:799, 1950.
5. Sirota, J. H., Yu T. F. and Gutman, A. B.: Effect of Benemid [p- (di-n-propylsulfamyl) benzoic acid] on urate clearance and other discrete renal functions in Gouty Subject. J. Clin. Invest., 31:692, 1952.
6. Kuchner, D., Dubin, A. and Bronsky, D.: Diuretic effect of Benemid on excretion of water, sodium and chloride in congestive heart failure. Fed. Proc., 13:435, 1954.
7. Boger, W. P., Beatty, J. O., Pitts, F. W. and Flippin, H. F.: Influence of benzoic acid derivatives on Metabolism of para-aminosalicylic PAS and penicillin. Ann. Int. Med., 33:18, 1950.
8. Talbott, J. H.: Clinical and metabolic effects of Benemid in gout. Bull. Rheumat. Dis., 2:1, 1951.
9. Pascale, L. R., Dubin, A., Hoffman, W. S.: Therapeutic value of probenecid (Benemid) in gout. J.A.M.A. 149:1188, 1952.
10. Bishop, C., Rand, R. and Talbott, J. H.: Effect of Benemid [p-(di-n-propylsulfamyl) benzoic acid] on uric acid metabolism in one normal and one gouty subject. J. Clin. Invest., 30:889, 1951.
11. Marson, F. G. W.: Sodium salicylate and probenecid in the treatment of chronic gout. Ann. Rheumat. Dis., 13:233, 1954.
12. Talbott, J. H., Lockie, L. M., Norcross, B. M. and Bishop, C.: Clinical and metabolic effects of Benemid. Ann. Rheumat. Dis., 11:294, 1952.
13. Gutman, A. B. and Yu, T. F.: Prevention and treatment of chronic gouty arthritis, J.A.M.A. 157:1096, 1955.
14. Phillips, R. W.: Reversal of renal insufficiency in gout: Report of case treated with probenecid (Benemid). A.M.A. Arch. Int. Med. 96:823, 1955.
15. Bartels, E. C.: Gout - Now Amenable to Control. Ann. Int. Med. 42:1, 1955.
16. Bauer, W. & Singh, M. M.: Management of Gout (concluded). New Eng. J. Med. 256:214, 1957.
17. Talbott, J. H.: Gout and Gouty Arthritis. New York, Grune & Stratton, Inc. 1953.
18. Bartels, E. C.: Treatment of Gout. Metabolism. 6:297, 1957.
19. Talbott, J. H.: Diagnosis and Treatment of Gout. Journal-Lancet 76:190, 1956.

Varicose Veins and the General Practitioner

● The pathological entity of varicose veins is seen frequently in general practice. Here is a clear, concise and valuable discussion which will help one to approach the problem intelligently, decisively and efficiently.

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IN the treatment of varicose veins we must realize that we are dealing with a progressive, degenerative condition of some of the vein walls. Any vein in the body may be involved but it is most common in the superficial veins of the lower extremities.

This condition may be congenital or develop secondary to many factors. The end result is the same: large dilated varicose veins with a reverse blood-flow and stagnation, secondary lymph stasis, edema and later a dermatitis and ulcer formation.

The title of this presentation, "Varicose Veins and the General Practitioner" was chosen because he is the one who is usually first consulted by the patient.

The early history of the treatment of varicose veins is so well known that, for the sake of brevity, it will be omitted. Beginning about 1900, the condition received much attention. Trendelenburg[1] made such a marked study of the condition that his name will always be linked with its treatment. Delbet[2] was most radical and did almost mutilating operations at times. Later, Babcock[3] Charles Mayo,[4] Matas[5] and John Homans[6] made great strides in their surgical treatment and our care of varicose veins today largely follows their teachings.

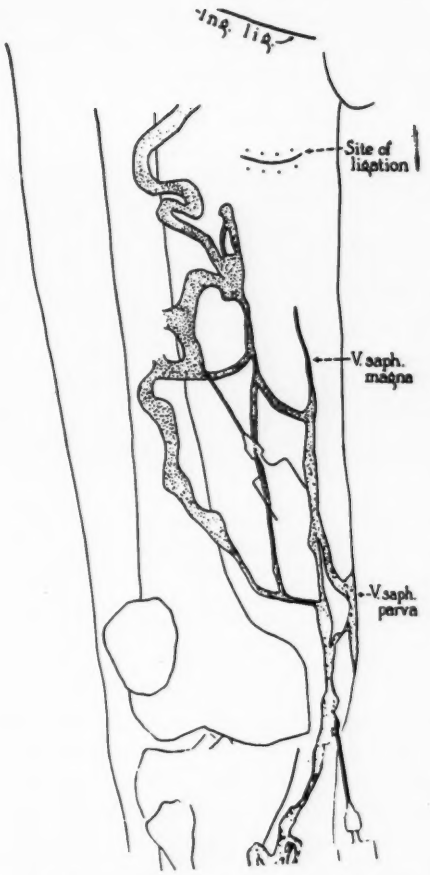


Fig. 2. Simple high ligation without either stripping or postoperative injections. It should be mentioned only to be condemned.

The injection treatment of varicose veins began with the invention of the Pravaz syringe in 1853. Many different solutions have been used with many and varied techniques. All have been used with the same basic theory of causing "a sufficient irritation to the intima of the vein to cause a thrombus to form and secondarily obliterate the vein lumen." In my experience (and in that of most surgeons) this has proved to be a failure. Karl Sigg is the only man of international prominence who treats all varicose veins by injections only.[7] He does no surgery on them other than to evacuate softened thrombi in the larger injected veins. He uses the Air-Block technique of Orbach[8] with some modifications. He claims exceptional results with many thousands of patients. For my-

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self, I use the Air Block plus my empty vein technique with the tourniquet. The dose varies with the solution used and the size of the vein being treated.



Fig. 1. Empty vein technique of injections. Leg has been elevated and varices drained of blood. Patient was lying on table. Tourniquet was applied and injections were made. The patient then sits up so the back pressure in the deep veins holds most of the injected solution in the varicosed segments. The ACE bandage is applied after the needles are removed and the patient is then instructed to walk a lot.

Briefly, the empty vein technique presupposes that the irritation of the solution would be more severe, evenly spread and better controlled if the solution was injected into the empty vein and not diluted with blood. Only small ½ cm. veins, the spider veins and those scattered segments remaining after surgery are amenable to the injection treatment. All perforators must be dissected and ligated.

The vein distribution is well studied with the patient standing on a stool. The actual point of injection is selected and marked lengthwise of the loop. The patient then lies down with the foot resting on a stool. A 2 cc. syringe containing the solution is fitted with a 1½ inch sharp, short beveled, 23 gauge needle which is inserted into the vein. While holding the foot and leg elevated to drain all the varicosed segments, the tourniquet is applied 8 to 10 inches above the segment being injected (Fig. 1). The foot is lowered to a footrest below level of the body and the solution is injected. With care and experience, this maneuver can be done well and without getting the needle point out of the vein. After the injection the needle is shoved through the vein thus transfixing it. All injections are made as quickly as possible and then the patient is allowed to sit up and rest for three minutes. This allows the solution to damage the intima sufficiently. The needles are then withdrawn and pads of cotton or gauze strapped over the site of the injection and an Ace bandage is applied. The patient then must walk four to six blocks immediately and continue much walking that day. This will wash out the solution that may have spilled over into the deep veins. A firmer and smaller thrombus will form if the bandage is worn very tight for several days.

The solutions most commonly used today are Sylnasol, Sodium Morruhate and Sotradecol.[7,8] As for myself, I still prefer Sylnasol; Sigg uses Sotradecol 1 per cent and 3 per cent strength in ¼ to ½ cc. doses. The injection treatment is much more effective if an emulsion is made by repeatedly withdrawing the solution from the vial and then forcing it back in under pressure. Thus you can make a fine foam. It is the only way it should be injected into the spider and the smaller veins. It is also better for the patient to wear the Ace bandage for several days. After seven to ten days as much of the fine thrombus should be evacuated as possible, using a number 11 blade and digital pressure. No anaesthesia is needed.

As stated above, practically all physicians today treat varicose veins surgically. The more thoroughly the job is done the better and longer lasting will be the result, Sigg to the contrary. All treatment is based on the acceptance of the idea of the reverse flow. This is easily demonstrated by the Trendelenburg test,[1] the multiple tourniquet test,[9] the milking test,[10] blood pressure readings in the veins,[11] and by palpation.[12]

Any good anaesthesia is suitable for this work. The author prefers a carefully given spinal. If done with a small 22 gauge needle and the newer technique there will be very few postoperative headaches. Pentothal Sodium is fine except for the nausea that many patients develop and as a rule they cannot ambulate as soon as under the spinal or local. Procaine plus marked sedation serves very well and has been used a great deal. I used it entirely for many years.

Special emphasis must be made of the preoperative study and marking of the veins.[12] Locate the foramen at the groin, mark the course of the saphenous through the thigh and all the varicosed segments. Search carefully for perforators. With firm digital pressure along the veins actual holes can be felt. It is very tender there and the patient will wince with pain each time as you come back and press in at that point. These are most com-

monly found along the inner lower thigh, inner all of the tibia and calf, mid-line of the calf and internal and just below the ankle. At surgery follow these pre-operative markings carefully. The perforators above the ankle and just below it may be the cause of an ulcer not healing or a dermatitis not responding to treatment.

Any surgery should be condemned as "puttering" that does not include a carefully done *high sapheno-femoral* ligation flush with the femoral vein (Fig. 2). This must be followed with a thorough dissection and ligation of all the perforators sub-fascially and a suturing of the hole of emergence.[13] Then all the varicose segments must be dissected and stripped out. I prefer the pliable Linton stripper in a set of three. The vein can be stripped either up or down. When the traction on the stripper shows a pulling in of the fat as the stripper head passes along, it means there is a large branch there. It should be cut down on and later dissected out. Incisions, adequate in size and number must be made to do this. At times this is best done with many small 1-inch incisions while at other times, long incisions with almost a block dissection must be used. I seldom use the radical Linton and Felder dissection but the incisions must be adequate and the work *must* be thorough.

A plexus of veins is often found below the popliteal space from the short saphenous and extending into the muscle of the calf. This should be dissected out.

At times the main popliteal vein is found to be widely dilated and sacculated. In that case, it remains filled with stagnant blood whenever the patient is standing. The blood pressure in the popliteal vein in such a case would be equal to the pressure of the venous column from the right heart down. It measures 40 mm. Hg. at the groin, 60 mm. at the knee and 100 mm. in the calf in the extensively developed case of varicose veins. Thus we would expect it to be 80 mm. to 100 mm. in the popliteal vein. This would allow the high back pressure on the valves in the communicating veins and thus blow them open. This is the reason we so often find new perforator veins and that new varicose vein formations develop after surgery.

The fact that we have had "no emboli" in over 9,000 ligations done during the past fifteen years proves that patients should have early and rapid ambulation. Elastic bandages (4-inch Ace) must be worn as long as there is any swelling.

Beginning two months postoperatively, all remaining varicosed segments must be injected at one-week to three-week intervals and the patient must be seen at yearly intervals thereafter.

The complications of varicose veins: phlebitis, dermatitis, ulcers, and so forth, deserve a special presentation. However, their prevention should be emphasized here because their best treatment is prophylactic.

INSTRUCTIONS FOR HOT PACKS

Must be bed rest. Useless to sit in a chair with the leg resting on another chair, and try to apply hot wet packs.

Body must be lying flat. Only one pillow under head.

Knee should be flexed slightly with the lower leg high on a pile of pillows 16 inches above level of mattress.

Best if the lower leg (knee to foot) is about on the level with the knee slightly flexed.

Packs should be applied at least 10 inches both above and below the area to be treated.

Temperature of packs should be 120 degrees to begin with and then increase as tolerated. Preferably to 130 degrees if the patient should not object.

Fresh packs should be applied as quickly as possible at time of change to prevent the cooling of the skin.

The packs are best applied by:

1. Folding a blanket four times and placing on top of a pile of pillows.
2. Fill the hot water bottles (several, one-half full) with hot water and right temperature. Compress the air out of the bottles as cork is tightened.
3. Wring the large bath towels and woolen blankets out of hot water. Quickly apply the wet towels, then the hot water bottles and then quickly wrap the blanket about it all and pin tightly.

If the above pack is properly applied, it will stay hot for at least two hours, and it should all be changed every two hours.

Best results will be obtained if the packs are continued for not less than four hours at a time.

When the ACE bandage is used and applied it is best if the patient walks a great deal.

Summary

The pathological entity of varicose veins is one of the most commonly seen in a general practice. Its care and treatment rightfully belongs in the hands of the general practitioner. He should acquaint himself with all the tests used in study of the case at hand and then qualify himself to do the best job of surgery possible in treating the condition. New varices will form as time goes by and pregnancies intervene. They should be analyzed and treated with the same thoroughness as was the original case. All patients should be rechecked yearly.

(References are on page 279)

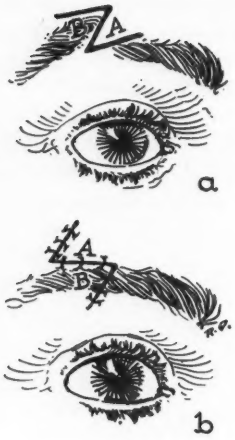


Fig. 1. *a.* Displacement of eyebrow. *b.* Correction by Z plasty.

Plastic Operations o[n] t[he] E[yelids]

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DEFECTS of the eyebrows and eyelids are conspicuous, some bordering on the grotesque; they demand correction for cosmetic reasons. Equally important, or more so, is the functional need of eyelids for preservation of vision. There are many congenital and acquired defects of the eyebrows and eyelids, and a multiplicity of methods for their repair. Only some of the more common defects and reparative methods will be discussed here.

A torn and displaced portion of the eyebrow that has healed in its new position disrupts the natural curve of the brow. The displaced portion can be repositioned by an interchange of triangular flaps known as a Z plasty (Fig. 1).

Partial or complete absence of the eyebrow requires replacement with hair-bearing skin. The easiest and most expedient method is the use of a hair-bearing free skin graft (Fig. 2). Such a graft can be taken from the scalp behind the ear without residual deformity of the scalp. The graft should be so cut and placed that the direction of the hairs corresponds with the lateral direction of the hairs of the eyebrow.



Fig. 2. *a.* Eyebrow and eyelid lost by trauma. *b.* After correction by skin grafting.

A small epithelioma in the eyebrow can be widely excised with a vertical incision. Microscopic examination of fresh frozen sections immediately after removal verifies the clinical diagnosis and determines adequacy of excision. Primary closure in a vertical direction restores the con-

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e Eyebrows and Eyelids

● Patients with defects of the eyebrows and eyelids need corrective surgical treatment both for the psychologic value of cosmetic improvement and for preservation of visual function. The author describes and illustrates a number of plastic surgical technics designed to aid correction of such distressing defects.

tinuity of the eyebrow. The small amount of foreshortening is not noticeable and is much preferable to leaving an area devoid of hair (Fig. 3). Benign tumors can be removed similarly, with less sacrifice of tissue.

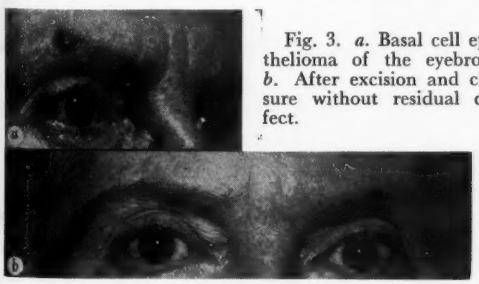


Fig. 3. *a*. Basal cell epithelioma of the eyebrow. *b*. After excision and closure without residual defect.

Small benign tumors of the eyelids, such as nevi, can be removed easily for microscopic examination, with light electrocoagulation of the base of the wound. The resulting small scar is not unsightly and requires no further treatment (Fig. 4). Simple excision and primary closure constitute another method frequently used.

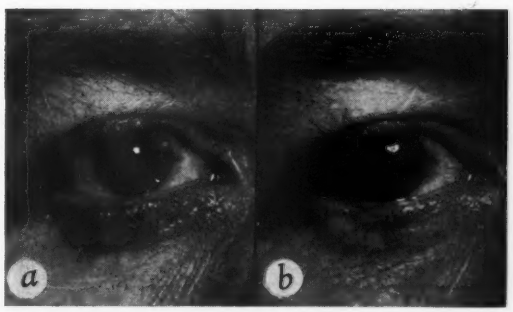


Fig. 4. *a*. Intradermal nevus. *b*. After surgical removal and light electrocoagulation of the base.

Excision of epitheliomas calls for wider removal, with greater attendant sacrifice of tissue. Those that have penetrated the skin and invaded the deeper structures require full-thickness excision of the eyelids. If one third or less of the width of the eyelid has been sacrificed, the defect usually can be closed by direct apposition and suturing of the wound edges. Sacrifice of more than one third of the width of the eyelid entails more extensive procedures for repair.

A fairly large epithelioma (Fig. 5) that requires sacrifice of the skin only can be corrected by a local sliding skin flap. Although the missing eyelashes are not restored, lack of them is not a source of discomfort to the patient nor cosmetically unattractive. The basal cell epithelioma seen in Figure 6 was treated by this method. If the epithelioma is in the medial half of the eyelid (Fig. 7), repair is accomplished with a local skin flap and a full-thickness skin graft is used to cover the donor site. The basal cell epithelioma seen in Figure 8 was treated thus. Establishment of the adequacy of removal by microscopic examination of fresh frozen sections from the specimen can give the plastic surgeon the opportunity for reconstructive measures at the time the lesion is removed.

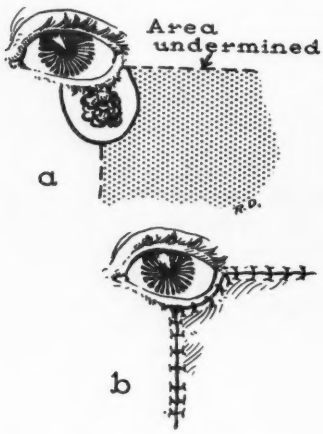


Fig. 5. *a*. Removal of lesion from left lower eyelid and preparation of local sliding skin flap. *b*. Closure.

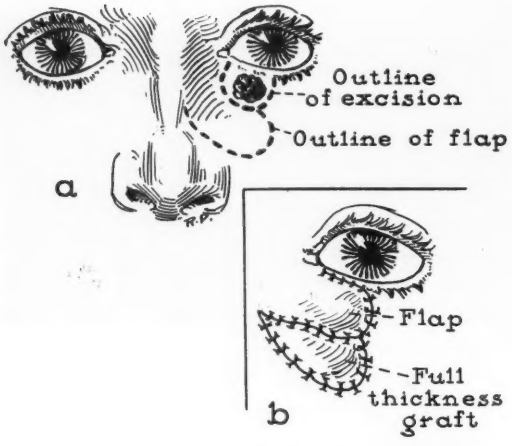


Fig. 7. *a*. Removal of lesion from medial portion of lower eyelid and preparation of local sliding skin flap. *b*. Repair of the defect with skin flap and full-thickness graft.

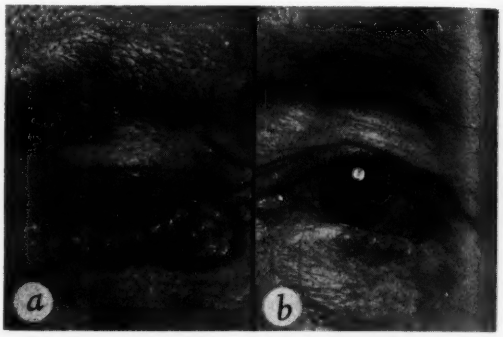


Fig. 6. *a*. Basal cell epithelioma of the lower eyelid. *b*. After excision and closure as indicated in Figure 5.



Fig. 8. *a*. Basal cell epithelioma of medial portion of lower eyelid. *b*. After excision and repair as indicated in Figure 7.

Loss of a major portion of the skin of the eyelid by physical trauma or thermal burn results in extensive scarring with shortening and ectropion. As the shortened eyelids cannot be closed, there is much discomfort. Usually, for this reason or for cosmetic improvement, the patient seeks out the plastic surgeon. A full-thickness skin graft with a good color match is best suited to correct the defect, and a graft fulfilling the requirements can be obtained from the postauricular region. The patient seen in Figure 2 had such a graft taken

from behind one ear, and later a second graft taken from behind the other ear, to give the total effect shown on the right upper eyelid. The grafts taken should be ample in both width and



Fig. 9. Repair after thermal burn of left side of face with loss of most of skin of left upper and lower eyelids. *a.* Result after attempted repair with full-thickness skin grafts of inadequate size, taken from both postauricular areas. *b.* After correction of severe ectropion of left lower eyelid and shortness of upper eyelid with split-thickness grafts. *c.* Result with eyes closed.

length. The patient seen in Figure 9 had had extensive thermal burns on the left upper and lower eyelids, with subsequent grafting of full-thickness skin taken from behind both ears. Being too small, the grafts had left the patient with the deformity

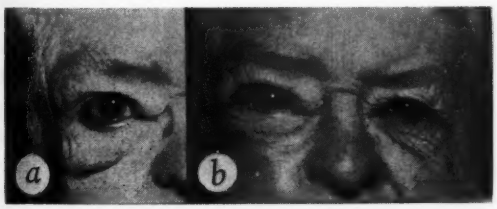


Fig. 11. *a.* Deformity of eyelid and redundancy of tissue after right facial paralysis. *b.* After correction.

shown. As all available skin had been taken from behind the ears, a split-thickness skin graft from the abdomen was used for correction, with the six-month results pictured. The patient was offered, but refused for the time being, a transfer of hair-bearing skin to replace the missing portion of the eyebrow.

Many of the injuries to the eyelids sustained in automobile accidents are lacerations involving little loss of tissue and no damage to the eye. Simple cleansing and closure with fine suture material, preserving all viable tissue, is sufficient (Fig. 10). When the loss is extensive, as in the case of the patient in Figure 2, reconstruction should be started as soon as possible. Unnecessary delay results in formation of much scar tissue that distorts the remaining normal tissues. Removal of the scar tissue and correction of the distortion add to the difficulties of the operation and detract from the final result.

Paralysis of the orbicularis oculi muscle is manifested by the patient's inability to close the eyelid and a greatly widened palpebral fissure, and occasionally by persistent epiphora. The correction—



Fig. 10. *a.* Lacerations of the eyelids, eyebrow and scalp. *b.* Appearance 10 days after repair which immediately followed injury.

lateral blepharorrhaphy, conducted under local anesthesia—consists in denuding a measured length of the free edge of the eyelids and suturing the raw edges together. This reduces the size of the palpebral fissure and makes the eye more comfortable, and the resultant appearance is close to normal.

When the skin of the lower eyelid is redundant, as seen in Figure 11, an alternative procedure is effective in removing the excess skin and also accomplishing the results obtainable with the first procedure. A horizontal incision is made at the temporal canthus, and through this incision the skin of the lower eyelid is undermined. A V-shaped excision of the tarsus and conjunctiva at the temporal canthus snugs up the eyelid and reduces the size of the palpebral fissure. The undermined skin is drawn laterally, the excess is excised and discarded, and the skin is sutured in its new position.

For most of the conditions discussed in this paper a single method of repair has been presented. Usually that method is the one most commonly employed. There are other methods, however, some equally good and many of sufficient merit to deserve the consideration of the surgeon in his choice for the problem at hand.

Incidence of Congenital He[ease]
Register[rses]

● *The authors estimate that there is one child with congenital heart disease in 186 live births. One can calculate from this that there are almost 450 new congenital heart cases added to the population of Minnesota each year.*

AMONG early work done in an attempt to determine the incidence of congenital heart disease was that of Rauh,[1] who surveyed the elementary and secondary schools in Cincinnati in 1939. Among the 58,611 children examined, ninety-five had "proven" congenital heart disease, or one in every 625. However, this study did not include children under age five; thus many individuals with serious lesions which had caused their demise before the age of five years were not included. In addition, there surely were children with undiagnosed defects of benign nature, such as some cases of patent ductus arteriosus and the ostium secundum type of atrial septal defect.

Robinson and Aggeler[2] performed a similar survey in San Francisco in 1947. Again, elementary and secondary school students were examined. One in 500 children was found to have congenital heart disease. It is to be remembered that more accurate cardiologic instruments, such as cardiac catheterization, were now available. This may explain the slightly higher incidence.

Gardiner and Keith[3] in 1951, reported a survey of children under age sixteen in Toronto. Not only were school children examined, but also an effort was made to include all postmortem examinations, child health center examinations, and examinations by private physicians. Each child suspected of having organic heart disease was referred to a central registry where a more thorough evaluation could be conducted. Among 134,467 children examined, 291 were found to have congenital heart disease, an incidence of one in 455 children.

In 1953, MacMahon, McKeown, and Record[4] reported on an extensive survey performed in Birmingham, England. They canvassed all postmortem and clinical records of hospitals, schools and death registries in an effort to locate all known cases of congenital heart disease in infants born during the years 1940-1949 within the limits of the city of Birmingham. Among 199,418 births during this period, they discovered 633 cases of congenital heart disease—an incidence of one in every 315 births.

In a more recent study published in 1955, Richards[5] and her group at Columbia Presbyterian Medical Center in New York City followed the offspring of all pregnancies delivered in their hospitals during the years 1946-53 for one year. Among 6,053 infants, fifty were believed to have

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Heart Disease Among the Offspring of Nurses in Minnesota

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congenital cardiovascular malformations. Twenty-five of these fifty had their lesions proved either by operation or autopsy. The incidence was one in every 120 births. In comparing their study to MacMahon's, these authors attributed their much higher incidence to closer supervision, greater

Important Notice

The nurses of Minnesota who are mothers are being asked to take part in a study designed to determine how many infants per 100 normal infants are born with malformations of the heart, their life expectancy, and their outlook in the future for curative treatment. To be accurate, a response from you is needed concerning all children borne by you, both normal and abnormal.

We feel that your greater knowledge of medical problems, your desire to help children so afflicted, and your willingness to add to medical knowledge will prompt you to return this information to us by **July 21, 1957** to be included in the study!

Name_____ Age at marriage_____

Address_____ Year of marriage_____

Children: Include all live births and still-borns. Please list in order of birth.

	Year of Birth	Male or Female	Does (did) child have Congen. Ht. Disease	Age at Death	Type of Malformation
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					

If child died, was the diagnosis proved by autopsy?_____

Where was autopsy performed?_____

Thank you in advance for your cooperation.

Please return by July 21, 1957 to:

PAUL ADAMS, M. D.
Director of Heart Research
Box 500, Variety Club Heart Hospital
Minneapolis 14, Minnesota

Please include any remarks on other side

Fig. 1. The survey questionnaire.

interest in malformations, and a higher rate of autopsies.

It is apparent that a wide variation in estimates of the incidence of congenital heart disease exists in the literature (Table I). In an attempt to obtain a more realistic estimate by means of a short-term study, a survey was made of the 14,614 registered nurses in the state of Minnesota. The results of that survey are the subject of this communication.

TABLE I. INCIDENCE OF CONGENITAL HEART DISEASE IN VARIOUS SURVEY POPULATIONS

Study	Year	Incidence
1. Rauh[1]	1939	1:625 children
2. Robinson and Aggeler[2]	1948	1:500 children
3. Gardiner and Keith[3]	1951	1:455 children
4. MacMahon, et al[4]	1953	1:315 births
5. Richards, et al[5]	1955	1:120 births

Methods and Materials

The offspring of the registered nurses of the state of Minnesota were used as the base population of the survey. Nurses, it was felt, would be more inclined to respond to an appeal for aid in medical research. It was also felt that the medical care received by their offspring would, by and large, be superior to that of the average of the population, and that any diagnosis of congenital heart disease on any of their children would be more thoroughly followed and more accurately recalled.

A questionnaire form was prepared (Fig. 1). This was sent to each of the 14,614 registered nurses on June 30, 1957, along with their 1958 license renewal forms. Although the license renewal forms were not due back to the State Board of Nursing until January 1, 1958, we requested that the questionnaire be returned by July 21, 1957. We accepted no more survey replies after August 15, 1957.

Only registered nurses who were mothers were asked to reply. Although it was impossible to determine how many of the 14,614 nurses were mothers, it was known that 8,343 (or 65.6 per cent) were either married, widowed, or divorced, and it was assumed that all of these were mothers.

The mothers were asked "*Does (did) the child have congenital heart disease?*" and then they were requested to specify the type of malformation.

By August 15, 1957, the State Board of Nursing had received 6,500 license renewals. If we assume the same ratio of married, widowed, or divorced as above (65.6 per cent), this would mean that, of the 6,500 renewals, 4,264 should have replied to the questionnaire. As of August 15, we had received 3,834 replies, or 89.9 per cent of the possible 4,264*. We felt that the response validated the survey.

There were a total of 8,546 children listed on these questionnaire replies, an average of 2.23 children per reply. These 8,546 formed the base population for the survey.

Each survey reply was reviewed. If it was felt that there was even the slightest suspicion of a congenital cardiovascular malformation, it was held for further review. Two of us (P. A. and R. C. A.) independently and blindly classified these suspicious forms as outlined below. Those few forms where there was disagreement were resolved at a general session of all those concerned with the project.

Results

The survey replies were classified as follows:

Group 1. This group included all cases where the malformation was specifically listed by the replying mother. In most of these replies, the mother stated that the clinical diagnosis had been confirmed by autopsy, surgery, or special studies. There were thirty-eight individuals in this group.

Group 2. This group included all cases where congenital heart disease was probable. Although the mother answered "yes" to the question "*Does (did) child have congenital heart disease?*" no specific malformation was listed. The additional remarks of the mother, however, were strongly suggestive of congenital heart disease. There were eight individuals in this group.

Group 3. This group included all cases where the mother had answered "yes," her child did have congenital heart disease. However, no specific diagnosis was listed and the accompanying remarks were not suggestive of congenital heart disease. There were sixteen individuals in this group.

*The 3,834 replies we received actually represents only 45.9 per cent of the possible 8,343 eligible registered nurses in Minnesota. However, since the mailing stated that licenses need not be renewed until January 1, 1958, many forms were received after August 15. These were not included in the survey because of the limitation in time available for this project.

Our initial reaction was that mothers with children having congenital heart disease might be more motivated to reply to the questionnaire than the average nurse. To evaluate this, we conducted an internal validity check; in the Heart Clinic of the Variety Club Heart Hospital, we had records of thirteen children whose mothers were registered nurses in Minnesota. Of those thirteen, only five (38.5 per cent) replied by August 15. This was even less than the over-all ratio of nurses who had replied by August 15 (45.9 per cent). It seems likely that mothers with offspring with congenital heart disease were not more motivated to reply to the questionnaire.

Group 4. In this group were included those replies where the mother had placed a question mark after the question *"Does (did) child have congenital heart disease?"* The history most often was compatible with a functional murmur. There were sixty-one individuals in this group.

Group 5. This group includes all replies where no congenital heart disease was mentioned. There were 8,220 individuals in this group.

The problem then arises—*How do we define the incidence of congenital heart disease?* Should we include only Group 1 (proven cases)? Then $38/8546 = 0.44$ per cent, or an incidence of one in 225 births.

Or should we include Groups 1 and 2 (proven and probable cases)? Then, $46/8546 = 0.54$ per cent, or an incidence of one in 186 births.

Or should we include Groups 1, 2, and 3 proven, probable, and suspicious cases)? Then, $62/8546 = 0.72\%$ or an incidence of one in 139 births.

Thus, our range is from one in 225 births (in the narrowest sense) to one in 139 births (where we are even including suspicious cases, which are most likely non-organic in nature). It appears that neither of these values is appropriate and that, for this survey, the correct incidence of congenital heart disease among the offspring of the registered nurses of the state of Minnesota would be the figure which includes Groups 1 and 2, or one in 186 live births. Unfortunately, it was not feasible to do follow-up studies on suspected cases.

TABLE II. ASSOCIATION OF MATERNAL AGE WITH THE INCIDENCE OF CONGENITAL CARDIOVASCULAR MALFORMATIONS
(Minnesota)

Maternal Age	Controls (43)	Groups 1 and 2 (46)
17-21 years	2.3%	4.3%
22-26 years	37.2%	34.7%
27-31 years	32.6%	34.7%
32-36 years	18.6%	15.3%
37+ years	9.3%	11.0%

Discussion

The ideal survey of the incidence of congenital heart disease would follow a very large group of persons from birth to death and autopsy. This must be regarded as an unattainable goal in view of the practicalities of modern research. An accurate estimate would be an acceptable substitute, and this is what this survey has tried to provide.

One other question which we thought this survey might be able to answer was the matter of a possible association between age of mother at time of birth and the incidence of congenital heart disease in these offspring. MacMahon[6] had investigated this problem in connection with his work on congenital malformations in Birmingham, England. He compared 588 children with clinically-proven congenital heart disease with a series of 1,015 controls, selected by taking every 200th birth from the city records.

To quote, "Differences between the two series are not significant." However, MacMahon did find that thirty-five of his 588 children with congenital heart disease were afflicted with Mongolism. Of these thirty-five, twenty-six (73 per cent) were born of mothers aged thirty-three years or more—a highly noteworthy figure.

TABLE III. ASSOCIATION OF BIRTH RANK WITH INCIDENCE OF CONGENITAL CARDIOVASCULAR MALFORMATIONS
(Minnesota)

Birth Rank	Controls (43)	Groups 1 and 2 (46)
1	41.9%	50.0%
2	32.6%	26.1%
3	18.6%	17.4%
4	2.3%	2.2%
5	4.6%	4.3%

Along the lines of MacMahon's study, we selected a control series of forty-three persons by taking every 200th person reported on this survey. This control series of normals was compared with the forty-six individuals in Groups 1 and 2. The results are shown in Table II. The children are grouped according to maternal age in five-year periods. No real association between age of mother at time of birth and the incidence of congenital heart disease in the offspring is evident.

The possibility of an association between birth rank and congenital heart disease was also considered. MacMahon[6] had found no consistent relationship in his series of 588 affected children and 1,015 controls. Richards and her group[5] at Columbia Presbyterian noted a slight increase in incidence with increasing birth rank but stated that no really significant relationship existed.

Our findings are shown in Table III. The percentage of first-born children with congenital heart disease is slightly higher than that of first-born controls. However, this difference is not statistically significant in view of the small number of individuals in each group, and there are no other significant differences in the other groups.

TABLE IV. SPECIFIC LESIONS REPORTED IN MINNESOTA SURVEY

Defect	Total Cases	Sub-Total Cases	Deaths	Per Cent Mortality	Average Age at Death	Alive	Average Age	Remarks
1. Interventricular septal defect	12		5	41.7	7 days	7	11 years	1 death at age 6 weeks—4 deaths at age 1 day
Pure IVSD		11						
IVSD+coarc.		1						
2. Cor triloculare biatriatum (single ventricle)	3		3	100.0	3 days	0		
3. Tetralogy of fallot	2		0	0.0		2	7 years	
4. Transposition of great vessels	1		1	100.0	11 days	0		
5. Coarctation of aorta	4		3	75.0	2 days	1	15 years	
Pure coarc.		3						
Coarc. + aortic stenosis		1						
6. Aortic stenosis	1		1	100.0	1 day	0		
7. Patent ductus arteriosus	1		1	100.0	12 weeks	0		Death occurred after corrective surgery
8. Pulmonary stenosis	2		0	0.0		2	11 years	
9. Interatrial septal defect	3		1	33.3	3 years	2	13 years	Death occurred after corrective surgery
IASD+PDA		1						
IASD+MI (AV canal?)		1						
IASD+anomalous IVC		1						
10. Tricuspid atresia	1		1	100.0	14 weeks	0		
11. Dextroposition (with hydrocephalus)	2		2	100.0	13 minutes	0		
12. Unspecified congenital heart disease	6		6	100.0	9 months	0		
Totals	38		24	63.2%		-		

A consideration of the thirty-eight persons in Group I (specific diagnosis listed) revealed that 24 (63.2 per cent) were dead at the time of survey (Table IV). Only two of the thirty-eight had been subjected to surgery: a twelve-week-old child with reversing patent ductus arteriosus, and a three-year-old with interatrial septal defect and anomalous inferior vena cava. Both of these children died subsequently.

By far the most common malformation cited was interventricular septal defect. Of the twelve cases reported, five or 41.7 per cent were dead, the average age at death being only seven days. The seven survivors averaged eleven years of age at the time of the survey.

The next most common malformation was coarctation of the aorta. There were four cases reported. Three were dead with a mean age at death of only two days. The one survivor was fifteen years old. The three atrial septal defects reported were all complicated by additional lesions, one by patent ductus arteriosus, one by mitral insufficiency, one by anomalous inferior vena cava. The three cases of cortriloculare biatriatum (single ventricle) all were dead, the mean age of death being only three days.

Summary

A questionnaire survey of the offspring of more than 14,000 registered nurses in the state of Minnesota was conducted in the summer of 1957 with the goal of defining more accurately the incidence of congenital heart disease. One child with congenital heart disease in every 186 live births can be regarded as a fair minimal estimate of the incidence of such malformations.

In agreement with other investigations, we were unable to find any significant differences in maternal age or birth rank between children with congenital heart disease and normal controls drawn from the same base population.

Of all the children reported with congenital heart disease, nearly two-thirds had died by the time of the survey, the great majority having died within weeks after birth.

Acknowledgment

Sincere appreciation is expressed to the registered nurses of the state of Minnesota whose response was so outstanding, and also to the Minnesota State Board of Nursing Examiners (Miss Lenore Collatz, Executive Secretary) without whose co-operation this survey would never have been consummated.

References

1. Rauh, L. W.: Incidence of organic heart disease in school children—Cincinnati, Ohio. Am. Heart J., 18:705, 1939.
2. Robinson, S. J., and Aggeler, D. M.: Heart disease in San Francisco school children—1947 Registry. J. Pediat., 33:49, 1948.
3. Gardiner, H. J., and Keith, J. D.: Prevalence of heart disease in Toronto children; 1948-49 Cardiac Registry. Pediatrics, 7:713, 1951.
4. MacMahon, B., McKeown, T., and Record, R. G.: The incidence and life expectancy of children with congenital heart disease. Brit. Heart J., 15:121, 1953.
5. Richards, M. R., Merritt, K. K., Samuels, M. H., and Langmann, A. G.: Congenital malformations of cardiovascular system in series of 6,053 infants. Pediatrics, 15:12, 1955.
6. MacMahon, B.: Association of congenital malformation of the heart with birth rank and maternal age. Brit. J. Soc. Med., 6:178, 1952.

Effect of Chlorothiazide on Patients with Edema of the Lower Extremities of Local Origin

● *One of the most promising of the new diuretics designed for oral use is chlorothiazide. Its field of application is constantly widening. This study outlines its use to correct chronic dependent edema of local origin in a group of state-hospital patients.*

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CHLOROTHIAZIDE is a potent oral diuretic whose effects have been demonstrated in animals[1] and humans.[2] This agent not only increases the secretion of water by the kidneys but also that of sodium and chloride and, to a lesser degree, of potassium and ammonium.[3] The potency of this drug as a diuretic agent is comparable clinically to that of the mercurial diuretics. It is effective in causing pronounced reduction or disappearance of edema associated with such conditions as congestive heart failure, the nephrotic syndrome, hepatic disease and toxemias of pregnancy.[3,4] The effectiveness of chlorothiazide as a diuretic and saluretic does not appear to diminish with continued use. When it is given as a diuretic, the usual total doses have been 0.5 to 2.0 gm. a day usually given in two or three divided doses.

We have confirmed the effect of chlorothiazide* administered orally as a diuretic in the elimination of the edema of congestive heart failure in a small series of cases. We also used chlorothiazide in the treatment of a patient who had advanced lymphosarcoma involving the axillary, cervical and inguinal lymph nodes and the spleen, with associated extreme edema of both lower extremities and moderate ascites. The edema and ascites had been progressive for a month when chlorothiazide was first administered, and the use of this diuretic resulted in progressive and complete disappearance of the edema of the lower extremities and the ascites, with loss of approximately 20 pounds in one week.

From the Rochester State Hospital and Mayo Foundation, Rochester, Minnesota.

*The chlorothiazide (diuril) used in this study was supplied by Merck Sharp & Dohme.

Present Study

Because of these experiences, we undertook a study of the effect of chlorothiazide given orally on a series of patients who had chronic edema of the lower extremities of local origin. The patients were primarily under treatment for mental illness at the Rochester State Hospital. For several months prior to the study, and during the control and the test periods, these patients remained under the same environmental conditions. They slept in the horizontal position without elevation of the lower extremities, their daily routine of physical activity, sitting in a chair and ambulation was not changed, and they ate the same regular hospital diet without restriction of sodium chloride. It was estimated that this diet contained at least 4 gm. of sodium chloride a day. None of these patients had evidence of nutritional deficiency, all were eating adequately, and none had evidence of congestive heart failure, hepatic disease or renal disease as possible causes for the edema of the lower extremities. Elastic bandages or supports were not used on the legs during the control period or the period of treatment.

During both the control and the treatment periods, the patients were weighed daily during the late afternoon or early evening, and measurements were made daily at the same time of the girth of the legs around the midcalf and just above

the ankle. Weights and measurements were determined at the same time of day for each patient during the entire study. The late afternoon was selected as the time for these weights and measurements because it was thought that the edema of the lower extremities would be maximal at this time during each twenty-four-hour period. During the control period and twice during the treatment period, each patient was examined and an estimation was made of the degree of pitting edema in the involved extremities. This was graded on the basis of 1 to 4. These examinations were carried out between 9 and 10 a.m.

TABLE I. EFFECT OF CHLOROTHIAZIDE ON CHRONIC LYMPHEDEMA OF LOWER EXTREMITIES

Case	Age, Years	Sex	Grade of Pitting Edema		Mean Weight Change During Treatment, Pounds	Mean Change in Circumference, Inches	
			Before Treatment	During Treatment		Calf	Ankle
1	53	F	2	1−	−1.6	−0.5	−0.5
2	77	F	2+	1−	−3.4	−1.5	—
3	58	F	2+	0	−3.2	−0.5	−0.3
4	48	F	2	0	−2.7	−0.5	−0.6

After the control observations had been made for a period of six to ten days for each patient, chlorothiazide was administered orally in doses of 0.5 gm. twice daily. After this amount of chlorothiazide had been given for seven to ten days, the dose was increased to 0.5 gm. three times daily for another period of seven to ten days. Each patient's weights for the control period were averaged and compared with the weights during the treatment period. The measurements of the involved legs for each location also were averaged for both the control period and the treatment period for comparison.

Causes of Edema in Patients Studied.—A total of twenty patients was treated. Of these, four were diagnosed as having chronic lymphedema; the lymphedema in two of these was of the post-inflammatory type and had followed one or more episodes of diffuse lymphangitis and cellulitis of the limb, whereas the cause of the lymphedema in the other two was uncertain and the condition was apparently a long-standing one, possibly representing so-called lymphedema praecox.

In eight of the patients, the cause of the edema was considered to be chronic venous insufficiency. All these patients had moderate to extensive varicose veins, and most of them had incompetency of the greater saphenous system. Most of them had other evidence of venous insufficiency, such as stasis pigmentation, local eczematoid changes in the skin and scars of previous stasis ulcers. The edema in some of these patients was unilateral, and in all it was worse in one leg than in the other, corresponding to the more extensive varicosities and changes in the skin.

In the remaining eight patients, the edema was designated as an idiopathic sedentary type, since there was no clinical evidence of lymphedema or local venous insufficiency or of cardiac, renal or hepatic disease. These eight patients were physically inactive, spending all or most of the day sitting in a chair. The edema was bilateral and was of essentially equal degree in both legs. It pitted easily, and the skin was soft and did not show the changes characteristic of either lymphedema or venous insufficiency. Dependency and lack of muscular activity in the legs were thought to be important factors in the production and maintenance of the edema in these patients, but other factors such as disturbances in nutrition, retention of sodium chloride, muscular and cutaneous atrophy secondary to aging, and possibly prolonged mental illness could not be excluded.

Results

The clinical effects of chlorothiazide are summarized in Tables I, II and III for each of the afore-mentioned three groups of patients, respectively. In these tables, the mean change in weight during treatment was computed as the difference between the means of the daily weights during the control period and the treatment period. The figures given for the degree of pitting and for the measurements are those for only one extremity for each patient, this being the one with the greater degree of edema when both legs were affected. The figures for the change in mean girth of calf and of ankle were computed as the difference between the mean of all the measurements during the control period and the mean of all measure-

ments during the treatment period for this limb for each patient.

As noted in Table I, the effect of chlorothiazide on the four patients with lymphedema was striking and rather consistent, since the edema was reduced to grade 1- or zero in all. None of these patients had extreme degrees of lymphedema when the treatment was started, although it was of at least moderate severity in all. The effects were somewhat less pronounced in the two patients with postinflammatory lymphedema than they were in the two who had probable lymphedema praecox. In three of these patients (Cases 1, 3 and 4), administration of chlorothiazide in doses of 0.5 gm. twice daily was resumed a few weeks after the end of the treatment period and after the edema had recurred. The medication was continued for eight months. During this time, edema was minimal or absent at each of several periodic examinations in all three patients and untoward effects did not occur as the result of the prolonged administration of chlorothiazide.

The effects of chlorothiazide on the edema of the eight patients who had chronic venous insufficiency were variable and in general somewhat disappointing (Table II). As a general appraisal, the results were good in two patients, fair in three and poor in three. It will be noted that discrepancies occur in the estimations of change in the degree of pitting and of the changes in weight and girth in some of these patients. This could be explained by the fact that the estimations of pitting were made in the morning and the measurements of weight and girth in the evening. It is well known that the edema associated with chronic venous insufficiency fluctuates considerably during a twenty-four-hour period, usually increasing progressively during the day and disappearing partially or completely during recumbency at night. All the patients in this group were at least moderately active during the day throughout this study.

TABLE II. EFFECT OF CHLOROTHIAZIDE ON CHRONIC VENOUS INSUFFICIENCY OF LOWER EXTREMITIES

Case	Age, Years	Sex	Grade of Pitting Edema		Mean Weight Change During Treatment, Pounds	Mean Change in Circumference, Inches	
			Before Treatment	During Treatment		Calf	Ankle
5	66	F	2	1	−3.6	−0.8	−0.4
6	68	M	2+	2	−0.6	−0.3	0
7	44	F	1+	1−	−4.0	−0.4	−0.4
8	73	M	2+	1−	−3.0	−0.5	−0.3
9	88	M	2	1	−5.5	−0.2	−0.4
10	50	M	2	1	−3.3	+0.6	+0.2
11	71	M	2+	1+	−2.5	−0.3	−0.6
12	87	M	2	1+	+0.7	+0.6	+0.1

TABLE III. EFFECT OF CHLOROTHIAZIDE ON IDIOPATHIC SEDENTARY EDEMA

Case	Age, Years	Sex	Grade of Pitting Edema		Mean Weight Change During Treatment, Pounds	Mean Change in Circumference, Inches	
			Before Treatment	During Treatment		Calf	Ankle
13	77	F	2+	1+	−4.2	−0.4	—
14	73	F	2+	2	−6.2	−0.3	−0.3
15	65	F	2	0	−3.0	−0.5	−1.9
16	47	F	3	3	−3.5	−0.5	0
17	72	F	2+	1−	−4.0	−0.3	−1.0
18	81	F	3+	1−	−2.2	−1.4	−1.7
19	79	M	2	1+	−2.2	−0.2	−0.6
20	61	M	2+	1−	−0.8	−0.2	−0.5

The effects of chlorothiazide on the edema of the eight patients having idiopathic sedentary edema were also variable (Table III). All these patients demonstrated some mean loss of weight during the period of treatment, but the loss of weight frequently did not correlate with the change in edema. Some discrepancies were noted in the change of the degree of pitting and reduction in girth of the limbs, which again might be explained by the difference in time of day when these two determinations were made. In general, three of these patients had a very good response, two had moderate results and three had a poor response. This rather pronounced variability of response may indicate that there were factors other

than dependency and physical inactivity that caused the edema in these patients and that varied among the different patients in this group.

chlorothiazide for periods of two to three weeks, and the effect was judged on the basis of decrease in pitting on pressure, change in weight and

TABLE IV. EFFECT OF CHLOROTHIAZIDE ON SERUM SODIUM AND POTASSIUM IN EDEMA OF LOWER EXTREMITIES OF LOCAL ORIGIN

Case*	Number Days Chlorothiazide Taken	Sodium, mEq./L.		Potassium, mEq./L.	
		Before Treatment	End of Treatment	Before Treatment	End of Treatment
1	15	131	137	4.1	3.7
2	22	136	136	5.0	3.2
3	19	134	126	4.8	4.1
4	16	135	130	4.5	3.8
5	19	133	126	4.2	3.5
7	14	127	126	4.3	3.2
8	19	135	137	3.7	4.5
9	19	146	143	3.6	3.6
10	19	140	141	4.1	3.9
11	19	138	137	3.9	3.2
12	19	141	143	4.9	5.0
13	17	130	127	4.5	3.8
14	15	139	133	4.9	2.9
15	44	133	135	4.7	4.2
16	24	138	129	4.0	2.9
17	19	130	143	4.8	4.0
18	36	138	133	5.5	4.3
19	19	142	139	—	4.5
20	19	140	137	3.7	2.9

*Not done in Case 6.

Determinations of serum sodium and potassium were made on nineteen of the twenty patients in this study during the control period and at the end of the treatment period. Although the majority of patients had some reduction in sodium and potassium during the treatment period as compared with the control period, the reductions were minimal in many and the values actually increased in some (Table IV). In a few patients, the values decreased slightly below the normal range, but none of the patients manifested any clinical symptoms or signs that could be attributed to hyponatremia or hypokalemia. No correlation could be established between the pretreatment values for sodium and potassium or the change in these values during treatment and the cause of the edema or its response to chlorothiazide. Other studies have shown that serum sodium and potassium may or may not decrease in patients treated with this drug, and our studies would confirm the advisability of periodic checks of these electrolytes in all patients who receive chlorothiazide for prolonged periods. It has been shown that the administration of 1 gm. of potassium chloride with each dose of 0.5 gm. of chlorothiazide will prevent any hypokalemia or hypochloremia that might be induced by the chlorothiazide.

Summary

Twenty patients with edema of the lower extremities due to local causes were treated with chlorothiazide. Four patients with chronic lymphedema of moderate degree all had good results from the treatment, and three of these again had similar results when treatment was resumed later and continued for eight months. Results of treatment with chlorothiazide in eight patients with edema caused by chronic venous insufficiency were variable, being good in two, fair in three and poor in three. Results of treatment were also variable among eight patients who had idiopathic sedentary edema associated with prolonged daily sitting and physical inactivity. The results in this group were very good in three patients, moderate in two and poor in three.

References

1. Baer, J. E.; Leidy, Lorraine; and Brooks, A. V.: Physiological disposition of chlorothiazide (6-chloro-7-sulfamyl-1, 2, 4-benzothiadiazine-1, 1-dioxide): A saluretic-diuretic agent. (Abstr.) Fed. Proc., 16 (part 1): 278-279 (March) 1957.
2. Ford, R. V., Rochelle, J. B., III, Handley, C. A., Moyer, J. H., and Spurr, C. L.: Choice of diuretic agent based on pharmacological principles. J.A.M.A., 166:129-136 (Jan. 11) 1958.
3. Laragh, J. H., Heinemann, H. O., and Demartini, F. E.: Effect of chlorothiazide on electrolyte transport in man: Its use in the treatment of edema of congestive heart failure, nephrosis, and cirrhosis. J.A.M.A., 166:145-152 (Jan. 11) 1958.
4. Finnerty, F. A., Jr., Buchholz, J. H., and Tuckman, John: Evaluation of chlorothiazide (Diuril) in the toxemias of pregnancy: Analysis of one hundred forty-four patients. J.A.M.A., 166:141-144 (Jan. 11) 1958.

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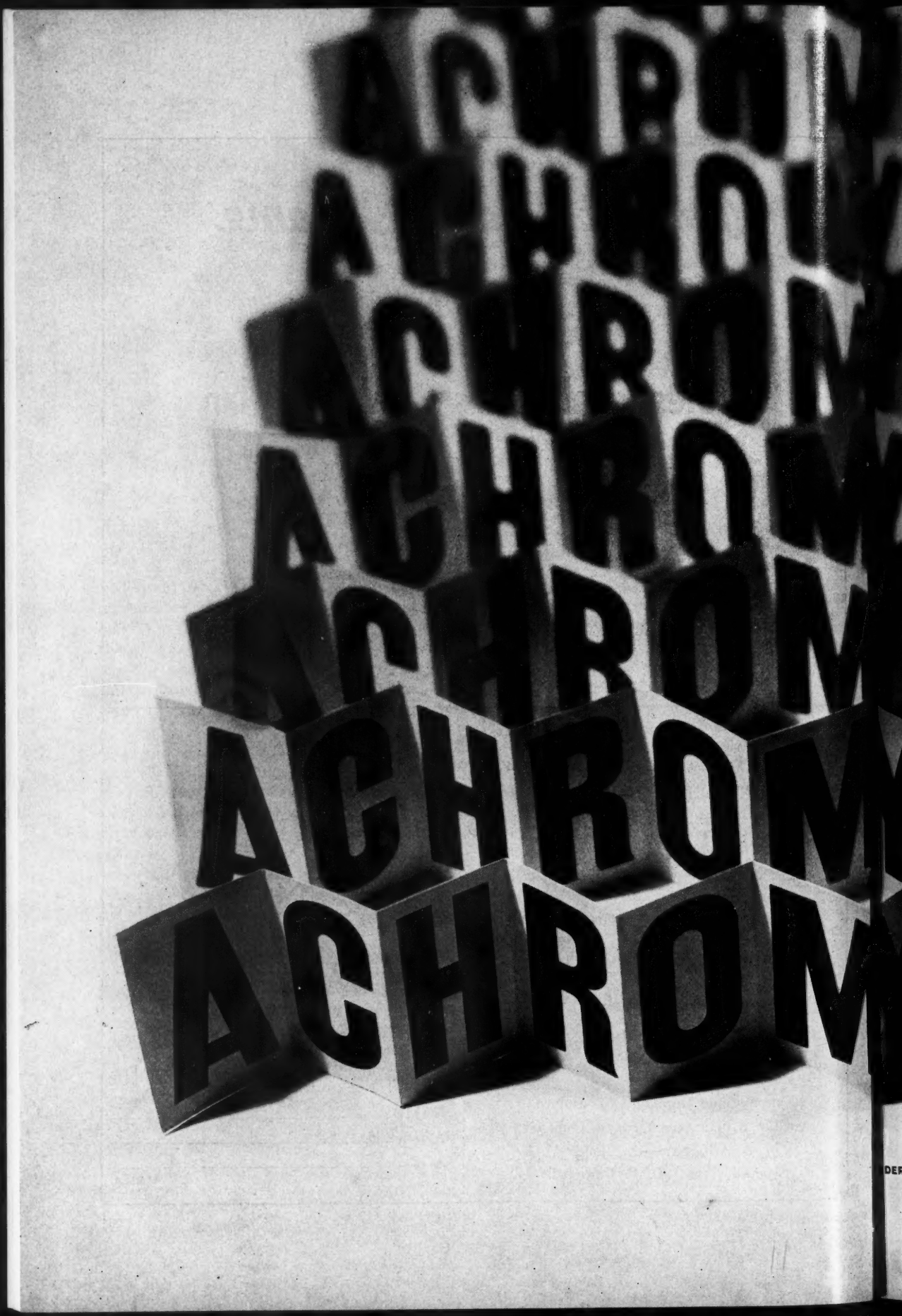
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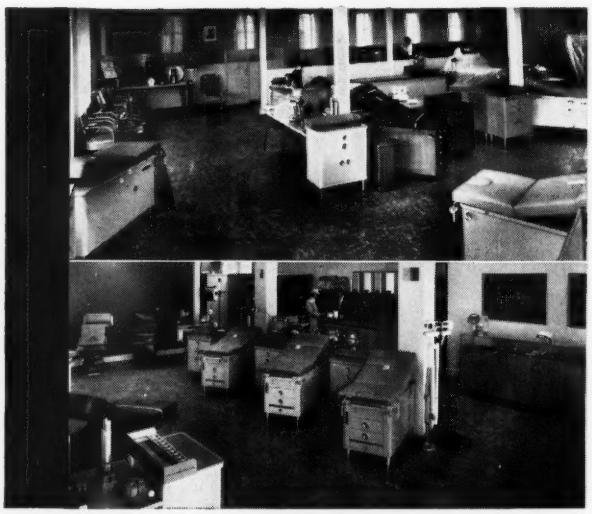
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Fig. 2. Baker, or heat cradle, with eight or ten 60-watt bulbs.

Physical Therapy in the General Practitioner's Office

GORDON M. MARTIN, M.D.
Rochester, Minnesota

With such equipment as a couple of plastic wastebaskets, clothesline, dime-store pulley, heat bulbs in photoflood clamp, simple heat cradles and sandbags, the general practitioner can handle many of the physical-therapy needs of his patients. This article tells how to utilize such inexpensive material for successful office physiatrics.

EFFECTIVE physical therapy can and should be provided in general office practice. However, to date it has been neglected in many places. Why? In order to answer this question, several other questions need to be considered:

1. Can a busy general physician effectively provide physical therapy for his patients? Yes, if he wants to.

2. Can anything be accomplished if no trained physical therapist is available? Yes, a physician can be a good therapist.

3. How much expensive apparatus is necessary? None.

4. Can a patient be taught to do his own physical therapy? Yes, practical home treatment can be learned through simple instructions consisting primarily of actually showing how.

A closer look at the answers to these questions should prove helpful.

Some Common Indications

Approximately 12 per cent of patients examined and treated in general practice have musculoskeletal problems that should benefit by physical therapy. Physical treatment is now recognized as standard procedure and essential in the management of such conditions as stiff and painful shoulder, sprains and strains, degenerative disease of the joint, whiplash injuries, rheumatoid arthritis, protruded-disk syndromes, residuals of hemiplegia, and static and postural backache. Present-day methods and high standards of medical practice, now routine in the medical centers, are being made available by the general practitioner to patients in smaller hospitals and the general office, and physical therapy should be included.

Know-How for the Physician

A primary requisite for successful office physical therapy is good common sense plus an understanding of the basic principles of body mechanics, therapeutic exercise, the use of assistive devices, and simple methods of applying heat. Sources of such information are readily available to the physician and include: (1) outstanding short courses on physical medicine and rehabilitation given frequently at the Center for Continuation Study at the University of Minnesota, (2) scientific sessions of the Section on Physical Medicine at the annual meeting of the American Medical Association, (3) articles in the *Journal of the American Medical Association,* MINNESOTA MEDICINE, *GP* and other journals, (4) special booklets such as the new *Strike Back at Stroke,*[1] which can be useful to both physician and patient, (5) scientific exhibits at the state and national medical meetings, and (6) informal conferences with physiatrists, who are always eager to help any physician interested in physical therapy.

Read at the Eighth Annual Refresher of the Minnesota Academy of General Practice, Rochester, Minnesota, October 21, 1958.

From the Section of Physical Medicine and Rehabilitation, Mayo Clinic and Mayo Foundation, Rochester, Minnesota. The Mayo Foundation is a part of the Graduate School of the University of Minnesota.

With a limited amount of special study, some extra reading, and an interest in making practical application of biomechanical and physiologic knowledge of the musculoskeletal system, a physician can function as a fairly good physiatrist and a more than adequate physical therapist when the need arises.



Fig. 1. A 250-watt reflector heat bulb with photoflood clamp attachment.

Some Basic Equipment

In the third question it was categorically stated that no expensive apparatus is necessary for general office physical therapy. Although manufacturers of physical therapy apparatus and their sales staff may serve as useful sources of basic information, one must remember that any big profits they may make must come from the sale of expensive equipment. Thus, they prefer selling a $900 diathermy machine to selling a $30 heat lamp. Likewise, a $1,600 exercise table with variable weights, pulleys and counterbalances intrigues the salesmen more than a simple powderboard and a set of sandbags.

Simple and inexpensive sources of heat for analgesic and vasodilating effects that can be used in the office or home include:

1. A 250-watt reflector heat bulb with a photoflood clamp attachment, for heating a small area (Fig. 1).
2. A baker or heat cradle with eight or ten 60 to 100-watt bulbs as a source of infrared or heat energy, which is useful for treating a lumbar strain or a condition of the lower extremities (Fig. 2). These sources of radiant heat are preferred over the heating pad, which is a common source of first and second-degree burns.
3. Contrast baths for the hands and feet, which require, at most, a couple of plastic wastebaskets, a bath thermometer (to insure having hot water at 110° F. and cold water at 60 to 65° F.) and a time schedule as indicated in Figure 3. These are useful for patients with arthritic disease, sprains and strains.
4. Hot moist packs. These may be a satisfactory source of local heat for office use.

Obviously, almost any amount can be spent on therapeutic heating devices, but one should remember that good physical therapy can be provided without diathermy and ultrasonic machines. Likewise, expensive electrical nerve and muscle stimulators are rarely used. For the occasional patient with Bell's palsy or peripheral-nerve injuries, a small battery stimulator providing manually interrupted direct-current impulses for use in the office and home is available (Fig. 4).[3] Generally, in office physical therapy the application of heat is merely a means to an end, and often the more important part of physical therapy is proper therapeutic exercise, which may be required to improve range of motion, muscular strength or co-ordination.

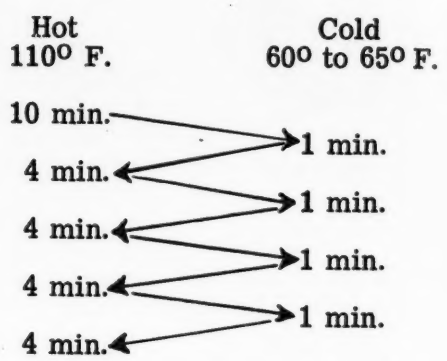


Fig. 3. Temperature and time schedule for contrast bath.

What to Do and How to Do It

Effective physical therapy in the general medical office requires a minimal amount of simple equipment, some basic knowledge of and interest in physical treatment, and a little time actually spent in "show how" for the patient.

Periarthritis or adhesive capsulitis of the shoulder, whether it has followed acute bursitis, trauma or myocardial infarction, or is of unknown cause, should be treated with a correct program of therapeutic exercise in order to increase range of

motion, maintain proper use of the shoulder musculature, and prevent development of a completely frozen shoulder. X-ray therapy, injections of hydrocortisone, and various forms of diathermy have their place but are of less importance than an adequate program of mobilization exercises. These patients rapidly develop many substitute motions, or else completely neglect to use the entire upper extremity and shoulder girdle.

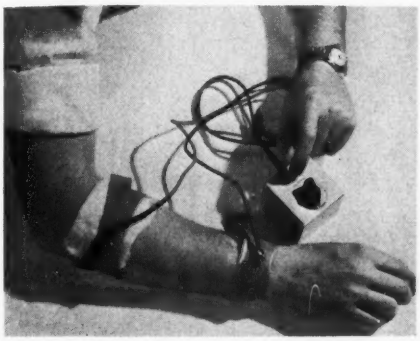


Fig. 4. Battery stimulator for home or office use.

The patient with moderate limitation of motion should be taught to do active exercise three or four times daily through the three primary shoulder motions, namely forward flexion in the sagittal plane, abduction of the arm in the frontal plane, and internal and external rotation with the arm abducted 30 to 60 degrees from the side. The patient should be carefully shown the proper way to do rotation with the scapula and shoulder girdle as fixed as possible against the bed or against the wall. He should learn the feel of this exercise when done correctly on the normal side in contrast to the side with the limited motion. The familiar wall-climbing (finger-ladder) exercise should be used for both flexion and abduction of the shoulder.

A simple and effective device that should be rigged up in the office is the overhead pulley arrangement; ordinary clothesline rope and a single, dime-store pulley may be used (Fig. 5). The patient should be taught to stretch the arm not only into abduction but also into flexion and to practice both internal and external rotation, the normal arm being used as the assistive force in all these maneuvers.

Degenerative disease of the knee joint presents a number of problems that require careful consideration. The mechanisms of wear and tear on a joint should be explained to the patient before he is instructed in the essential measures for protection of the joint. Besides the usual need for

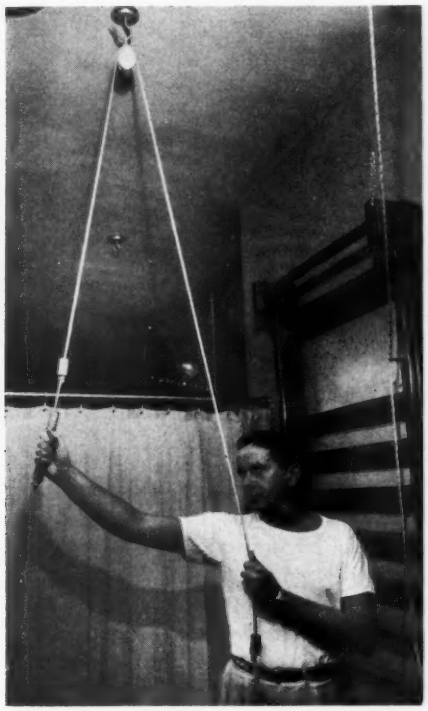


Fig. 5. Overhead pulley for shoulder-mobilization exercises.

reduction of weight and limitation of activity, the patient should be carefully taught how to maintain or increase the strength of the quadriceps femoris muscle. Atrophy with weakness of the quadriceps is an extremely common finding in degenerative disease of the knee joint, often becoming so marked as to be a major factor in the patient's disability, which is manifested by difficulty in climbing stairs and in getting in and out of chairs.[3] Heat and massage alone are of little value for patients whose pain occurs only during weight-bearing activities.

The best way to increase strength of the quadriceps is to teach the patient a definite procedure for doing progressive resistance exercises regularly at home. Simple sandbags can be made up at home and hung over the ankle (Fig. 6). With a set of these available in the office, the physician can help the patient determine what weights he can carry at his first exercise periods and then he

can be instructed in increasing the amount of weight at intervals of one week (Fig. 7). Essentially normal quadriceps power will increase stability of the knee and decrease both discomfort and disability.

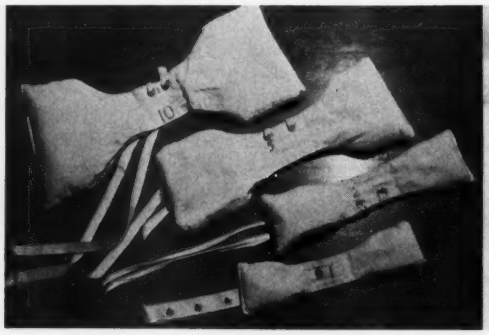


Fig. 6. One, 2, 5 and 10-pound sandbags for resistive exercises.

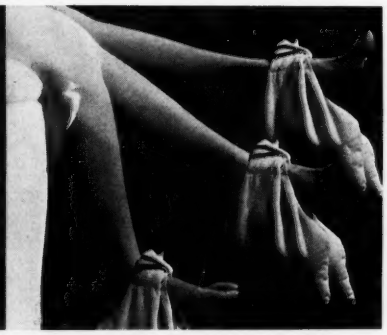


Fig. 7. Sandbag being used for strengthening quadriceps femoris.

Several techniques are available for doing progressive resistance exercises. The DeLorme technique and the Oxford technique use thirty contractions at each exercise period. The basic weight is called "the ten repetition maximum" which is the maximal weight the patient can lift ten times to a position of full extension without stopping. Approximately three-fourths and one-half of this basic weight are then used in groups of ten contractions at each exercise period. Occasionally, such a program may have to be modified to ten or fifteen contractions at each period; or possibly isometric contractions, with resistance, will prove more effective and be better tolerated than carrying the weights through an arc of 90 degrees.

Degenerating weight-bearing joints should, in many instances, be protected from maximal weight-bearing by the use of a cane or crutches. The patient must understand the reasons for using the cane or crutches and may have to be assured repeatedly that cane or crutches should not be considered stigmas of progressive invalidism. Correct fitting of these aids should be the responsibility of the physician. Not one patient in ten who is merely told to use a cane for a painful knee or ankle will find one of the correct size or will use it correctly. When the physician has prescribed the use of a cane for protection of one lower extremity, almost without exception the patient should be taught to use the cane in the opposite hand, with the height adjusted so that the elbow is flexed about 30 degrees when the shoulders are level. The patient should be instructed to keep the cane close to the body and swing it forward with the involved extremity. From time to time the patient should check his own gait by walking toward a full-length mirror in order to see that the shoulders are kept level, the involved leg vertical and not abducted, and the cane close to the body.

The proper fitting of crutches can best be done with a pair of adjustable crutches, which should always be kept handy in the office. Crutches of proper length come to 1 fingerbreadth below the axilla in the normal position, with the crutches about 8 inches lateral from the feet. The hand grip should be adjusted to such a height that the elbow is flexed about 30 degrees (Fig. 8).

In walking with crutches the patient must be taught to bear his weight on his hands, not letting the shoulders hang on the crutches or hike up to a level with the ears. The most satisfactory gait for a patient with degenerative disease of one knee or hip joint is the three-point gait with part of the weight being borne on the involved leg. In this gait the patient moves both crutches ahead simultaneously with the involved leg. Then with the crutches placed on the ground in line with the foot, the greatest part of the weight is transmitted through the arms to the crutches while the involved leg is in contact with the floor and while the good leg swings forward. In this gait the patient should be taught to move the hip, knee and foot of the involved leg in a normal walking pattern. Initial training for a few minutes is much simpler than attempting to correct bad habits in a patient who has tried to master crutch-walking by the trial-and-error method.

If the degenerative changes are bilateral, a two-point alternate crutch gait will permit some reduction in weight-bearing on both lower extremi-

ties. In the two-point gait, the patient is instructed to move the opposite crutch and leg simultaneously and proceed in a normal walking pattern.



Fig. 8. Faulty body mechanics and faulty crutch-walking result from incorrectly fitted crutches. From left to right: crutches too long, crutches too short, and crutches of correct length.

Patients with severe degenerative disease of the joint who are not candidates for any surgical correction and who may require prolonged use of crutches may be much happier with the short, aluminum, German crutches, which are lighter and less cumbersome than the wooden ones.

Some patients with severe degenerative disease of the joint or other permanent disabilities and chronic disease may need advice and guidance of the physician in seeking a new and more suitable occupation. If this cannot be handled easily by the local physician and local agencies, the physician should see that the patient is properly referred to one of the six offices of the state vocational rehabilitation association.

Electronic St. Vitus Dance

The present typically American promotional craze involves vibrating, gyrating, rocking or rolling cushions, chairs, couches, tables, and mattresses—available either in heated or unheated models. "Effortless exercise" for weight reduction, relaxation, and improvement of muscle and tissue tone is a major theme of the advertising.

Suggestions as to beneficial effects of these contrivances in arthritis, rheumatism, heart disease, backache and other troubles are often included in the salesman's "spiel," but not in the printed literature. No scientific evidence that is convincing to discerning physicians has yet appeared in support of these claims.

The public is being duped and attempts are being made to involve physicians both directly and indirectly in some of the promotional schemes. Shall we be made a party to these schemes? No, let's not! Although it is unlikely that any of us will knowingly lend direct support to the schemes or schemers, we must avoid even the indirect support that is inherent in thoughtless, vague or implied approval of these contrivances, which essentially are therapeutically worthless and, for some patients, potentially hazardous.

References

1. United States Department of Health, Education, and Welfare: Strike Back at Stroke. Washington, D. C.: United States Government Printing Office, 1958.
2. Stillwell, G. K.: A battery stimulator for denervated muscles. Arch. Phys. Med., 37:689-691 (Nov.) 1956.
3. Anderson, T. P.: Management of degenerative joint disease of knee. Arch. Phys. Med., 36:154-159 (Mar.) 1955.

The Hennepin Counterin

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Minneapolis, Minnesota

Director, Division of Special Services and Acting Chief of Section of Maternal and Child Health, Minnesota Department of Health.

THE Minnesota Maternal Mortality Study is a joint study of the Minnesota State Medical Association and the Minnesota Department of Health in co-operation with the Department of Obstetrics of the University of Minnesota. It was first established in 1941 on the basis of recommendations of the Minnesota Obstetrical and Gynecological Society. It is carried out through personal visits to the attending physicians, consultants, and hospitals by obstetrician-investigators who obtain all pertinent data and records. As a result of its successful operation and because of its effectiveness and acceptance by physicians and hospitals, the Minnesota Department of Health, in 1951, proposed a neonatal mortality study.

The approach, however, could not be the same because of the difference in the number of deaths involved. Whereas in the maternal mortality study not more than fifty to sixty annual deaths occurred, including nonobstetrical deaths which are a part of the study, there are some 1,400 neonatal plus 1,200 fetal deaths annually in Minnesota. A state-wide study would thus constitute a rather formidable task.

Furthermore, clinical records in rural hospitals are frequently scanty and limited and autopsies are less frequent. It was, therefore, decided that a pilot study in one large metropolitan area was advisable. After the pilot study had demonstrated its value it was planned to extend the study to other areas in the state.

Hennepin County, which includes the City of Minneapolis, was selected for the pilot study because it has a limited number of neonatal deaths and yet has approximately one-fourth of all Minnesota births and neonatal deaths and would constitute an adequate sample. It has more complete clinical records and has a higher percentage of autopsies. There are fourteen hospitals with maternity departments serving both the metropolitan and rural areas, and a hospital council representing these hospitals. Moreover, it is a convenient and easily accessible area since the State Department of Health is located on the University Campus in Minneapolis and necessary services and facilities would be readily available.

The proposal was submitted to the Child Health Committee of the Minnesota State Medical Association and after approval, to the council of this association, the Hennepin County Medical Society, the Northwest Pediatric Society and the Minne-

Presented at Institute on Perinatal Casualties, University of Minnesota Center for Continuation Study, December 9, 1958.

unterinatal Mortality Study

● The American Medical Association has stated that the goal of perinatal casualty studies is "to improve the production of normal human beings by the elimination of needless deaths and damage during the process of reproduction." This report describes the objectives, approaches, the modus operandi, and the results. These experiences should stimulate the further development of similar studies throughout Minnesota.

apolis Hospital Council. Hennepin County Medical Society and the Northwest Pediatric Society each appointed three members and the Minneapolis Hospital Council appointed one hospital administrator to the proposed committee. Along with representatives from the Section of Maternal and Child Health of the State Health Department and the professors of pediatrics and pathology of the University of Minnesota, these constituted the nucleus of the study committee.

Other interested groups were contacted and agreed to help sponsor the proposed study. The Hennepin County neonatal mortality study began on January 1, 1952 as a cooperative undertaking of the Hennepin County Medical Society, Minneapolis Pediatric Society, Minneapolis Obstetrical Society, Minneapolis Chapter of the American Academy of General Practice, Minneapolis Health Department, Minneapolis Hospital Council, departments of pediatrics and pathology of the University of Minnesota Medical School, and the Minnesota Department of Health.

The neonatal mortality study committee has consisted of or now consists of the following: Drs. William H. Anderson, Eldon B. Berglund, William Bevis, Joel G. Brunson, Eunice A. Davis, James R. Dawson, E. J. Diefenbach, Claude J. Ehrenberg, S. Feinberg, Aaron Friedell, Evelyn E. Hartman, Frederick H. Lott, N. H. Lufkin, George Lund, Irvine McQuarrie, E. C. Maeder, E. S. Platou, Richard Raile, H. R. Ransom, L. F. Richdorf, A. B. Rosenfield, S. S. Scherling, Robert A. Ulstrom, L. W. Wannamaker, Mr. Russell Nye, Administrator at Northwestern Hospital, and Mr. Thomas Cook, Executive Secretary of the Hennepin County Medical Society. The membership has thus included pediatricians, obstetricians, general practitioners, pathologists, public health physicians, an anesthesiologist, a radiologist and a hospital administrator. The chairman and secretary are elected by the committee. Dr. Richdorf, chairman and chief of the Section of Maternal and Child Health of the State Department of Health, serves as secretary. One of the obstetricians on the committee is also a member of the maternal mortality committee and thereby provides a liaison between the two study groups.

In general, the objective of the study is to reduce to a minimum the preventable factors which are associated with neonatal mortality by a detailed study of each death, including management of the pregnancy, labor and delivery, management

of the newborn, nursery procedures, and the adequacy of facilities, records, and autopsies.

More specifically, the committee—

1. Considers the clinical history, physical findings, laboratory procedures, the course of events, and the diagnosis, in relation to autopsy findings.
2. Rates responsibility—
   Was it a pediatric or obstetric death?
   Was it preventable, nonpreventable, or unclassifiable?
   Was there adequate prenatal care?
   Were obstetric and pediatric care proper and adequate?
   Were hospital facilities adequate?
   Was the autopsy adequate?
   Was physician, hospital or family at fault?
3. Judges adequacy of records, autopsies, facilities and services.
4. Points out findings and inadequacies and makes suggestions for reducing preventable factors by an educational program—
   through hospital staff meetings
   at medical society meetings
   through medical journals and bulletins
   through other educational approaches
   at undergraduate and postgraduate levels.

It was estimated that there were approximately 385 neonatal and 300 fetal deaths per year in Hennepin County. It was agreed to limit the study to neonatal deaths, defined as deaths under twenty-eight days of life, for a period of one year following which the committee would decide, on the basis of acceptance and accomplishments, whether or not it should be continued for a further limited period or indefinitely. The question of including fetal deaths was also to be determined at this time. At the end of the first year of operation the committee agreed to continue the study for a period of five years and to include fetal deaths at a later date during this period of study.

From 1952 through 1954 the study included an analysis of the deaths of liveborn infants of more than twenty weeks' gestation who failed to survive the first twenty-eight days after birth. Since January 1, 1955, it has also included fetal deaths of more than twenty weeks' gestation, and the name was therefore changed from "neonatal" to the more inclusive term, "perinatal." Minnesota law requires reporting of live births and fetal deaths of more than twenty weeks' gestation and therefore those under twenty weeks of gestation are not included.

The committee agreed that each participating hospital staff should appoint a hospital liaison committee consisting of an obstetrician, a pediatrician and a pathologist, or physicians with special interest in this problem, to act as the liaison group between the hospital, the record librarian and the neonatal mortality study committee, and to be responsible for the completion of the study report forms. Committee members met with the various hospital staffs to explain the method of operation. The proposed study and the appointment of a liaison committee were approved by the staffs of all hospitals. The hospital liaison committees, directly or through their record librarians, submit the required data for each perinatal death to the secretary of the study committee. To make the reporting as complete as possible, copies of all fetal and neonatal death certificates are prepared by the Minneapolis Health Department and mailed to the secretary monthly. The certificates are matched with the report forms received from each hospital and monthly reminders are sent to hospitals indicating the specific cases on which information has not as yet been submitted. Every effort is made to obtain complete voluntary reporting.

The Perinatal Mortality Study Committee has developed a questionnaire study form which is distributed to all the hospitals. The liaison committee in each hospital is responsible for obtaining the required data on each local perinatal death. This is done with the assistance of the hospital record librarians and, if necessary, of the attending physicians. These report forms are filled in as soon as possible after the hospital clinical record of the case is complete. They are then submitted to the study committee. When the data submitted are not sufficient for committee analysis, personal visits are made to the hospital for additional data. Committee members are on the staff of many of the participating hospitals but not all hospitals are represented. The report form lists the data, the name of the patient, the physician and the hospital on a detachable tab which is removed in the office of the secretary of the study committee. A code letter for the hospital and a code number for the patient are placed on the form and on the autopsy report before they are reviewed by the committee. To assure complete anonymity, the coded tabs are retained in a confidential file at the state department of health. A Minnesota statute makes it a misdemeanor to reveal this confidential material and protects all parties involved by not allowing it to be admitted

in any court or before any other tribunal, board, or other agency.

The full committee meets in closed session about once a month. In the interim a small subcommittee meets to screen the deaths. A summary of the pertinent data from each case is presented to committee members at the meeting. For controversial and complicated cases, the complete data are presented to the committee for consideration. Each case is discussed in an objective and impartial manner. Responsibility is classified as obstetric, pediatric, medical, or assigned to the hospital. Each case is judged preventable, nonpreventable, or unclassifiable. The specific factors in each case are listed as (1) inadequate prenatal care, (2) family at fault, (3) physician's error in judgment, (4) physician's error in technique, (5) intercurrent disease, (6) unavoidable disaster, or (7) inadequate autopsy. When the case is unclassifiable, the reasons for this fact are listed—for example, "inadequate records" or "inadequate autopsy." All the pertinent data and the committee findings and classifications are transferred to McBee Keysort system punch cards for ease in tabulation.

Necessary funds for the study are provided by the State Health Department. This includes the services of a staff pediatrician who devotes about one-half time to the study, report forms and supplies, cost of mailing notices of meetings and correspondence, and general administrative and clerical costs.

Information gained through the county-wide study of perinatal deaths is used as basis for recommendations and suggestions in the committee's educational program, which includes frequent reports and special articles in the *Bulletin of the Hennepin County Medical Society*. Annual reports in MINNESOTA MEDICINE include rather extensive statistical analyses, summaries of case histories, and comments of the committee on deaths considered to have been preventable. Committee findings are also disseminated at medical society and hospital staff meetings. Contact with under-

TABLE I. PERINATAL DEATHS IN HENNEPIN COUNTY, MINNESOTA 1940-1956

Year	Live Births	Neonatal Deaths*	Fetal Deaths†	Rate/1000 Live Births	
				Neonatal Death	Fetal Death
1940	10,130	241	246	23.8	24.3
1945	12,336	287	287	23.3	23.3
1950	18,672	381	313	20.4	16.8
1952	19,941	254	295	17.8	14.8
1953	20,460	417	329	20.4	16.1
1954	21,309	369	293	17.3	13.9
1955	21,968	419	287	19.1	13.1
1956	22,521	408	300	18.1	13.3
1957	23,743	439	303	18.4	12.8

*Infant deaths during first twenty-eight days of life.
†Over twenty weeks' gestation.

TABLE II. DURATION OF LIFE BY BIRTH WEIGHT
Hennepin County Perinatal Mortality Study
1952-1955

Duration of Life	2500 Gm. or Less		Full Term		Total	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Under 1 hour	138	14.0	49	12.7	187	13.7
1 to 24 hours	519	52.8	119	30.8	638	46.6
24 to 48 hours	164	16.6	70	18.1	234	17.1
2-7 days	114	11.6	87	22.5	201	14.6
8-28 days	49	5.0	61	15.8	110	8.0
Total	984	100.0	386	99.9	1370	100.0

TABLE III. CAUSES OF 1,370 NEONATAL DEATHS
Hennepin County Perinatal Mortality Study
1952-1955

Cause of Death	2500 Gm. or Less		Over 2500 Gm.		Total	Per Cent
	Number	Per Cent	Number	Per Cent		
Abnormal pulmonary ventilation	756	76.8	79	20.5	835	60.9
Congenital anomalies	84	8.5	143	37.0	227	16.6
Infection	37	3.8	37	9.6	74	5.4
Birth trauma	42	4.3	28	7.2	70	5.1
Blood dyscrasia	18	1.8	54	14.0	72	5.3
Anoxia	24	2.4	21	5.5	45	3.3
Others	23	2.3	24	6.2	47	3.4
Total	984	99.9	386	100.0	1370	100.0

graduate and graduate teaching is facilitated by the fact that the committee includes representatives of the Medical School's departments of pediatrics and pathology.

TABLE IV. AUTOPSIES BY INFANTS' BIRTH WEIGHT
Hennepin County Perinatal Mortality Study
1952-1955

Weight	Number and Percentage of Infants Autopsied							
	1952		1953		1954		1955	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
(Premature) 2500 grams or less	122/238	51.0	140/270	52.0	134/215	62.3	163/261	62.5
(Full-term) over 2500 grams	74/95	77.9	95/109	87.1	75/85	88.2	87/97	89.7
Total	196/333	59.0	235/379	62.0	209/300	69.7	250/358	69.8

A few selected tables of the statistical data of the study are briefly reviewed. Table I gives the neonatal and fetal deaths and rates for Hennepin County from 1940 through 1957.

Analysis of the data for the first four years (1952-1955) in Table II shows that 72 per cent of the 1370 neonatal deaths were infants weighing 2,500 grams or less. Of these premature infants, 67 per cent died during the first twenty-four hours after birth and 83 per cent during the first forty-eight hours. Of all the neonatal deaths three-fourths occurred during the first two days and 92 per cent during the first week of life.

Table III, which presents the causes of neonatal deaths shows that abnormal pulmonary ventilation, which includes immaturity unqualified, atelectasis and hyaline membrane disease, accounted for 61 per cent of the deaths. Three-fourths of the premature infants were in this category in contrast to 20 per cent of the full-term infants. Congenital anomalies were the second cause of death, responsible for 16.6 per cent. Among the full-term infants anomalies were the leading cause, responsible for 37 per cent of full-term deaths but for only 8.5 per cent of the premature infants.

TABLE V. RH DETERMINATIONS BY YEARS
Hennepin County Perinatal Mortality Study
1952-1955

Year	Per Cent of Rh Determinations Done
1952	70.0
1953	68.3
1954	71.6
1955	80.8

TABLE VI. RATING OF NEONATAL DEATHS
Hennepin County Perinatal Mortality Study
1952-1955

Classification	2500 Gm. and Under	Over 2500 Gm.	Total Number	Per Cent of 1370 Neonatal Deaths
Preventability				
I. Preventable	43	58	101	7.4
II. Non-preventable	912	297	1209	88.2
III. Unclassifiable	29	31	60	4.4
Responsibility				
A. Obstetrical	810	132	942	68.8
B. Pediatric	169	257	426	31.1
C. Inadequate hospital facilities	0	1	1	.1
D. Medical	30	13	43	3.1
Factors involved				
1. Inadequate prenatal care	20	5	25	1.8
2. Family at fault	106	44	150	11.0
3. M.D. error of judgment	45	54	99	7.2
4. M.D. error of technique	6	9	15	1.1
5. Intercurrent disease	20	17	37	2.7
6. Unavoidable disaster	890	282	1172	85.6

Table IV shows that during the first year of the study the autopsy rate on all neonatal deaths was 59 per cent (51 per cent for prematures and 77.9 per cent for full-term infants); by the fourth year (1955) the over-all rate had increased to 69.8 per cent (62.5 per cent for premature and 89.7 per cent for full-term infants).

There has been a gradual increase in Rh determinations from 70 per cent in 1952 to almost 81 per cent in 1955, shown in Table V.

Table VI summarizes the findings relative to preventability and responsibility for the first four

years of the study. It will be noted that 101 (7.4 per cent) of the 1370 neonatal deaths were judged preventable. While only 4.4 per cent of the premature neonatal deaths were rated as preventable, 15 per cent of the full-term neonatal deaths were considered preventable. An additional 12.8 per cent had inadequate prenatal care or the family failed to seek early prenatal care. However, on the basis of individual preventable factors rather than preventability of death the percentage is considerably higher. For example, Table VII shows that in 1955, out of 358 neonatal deaths there were ninety-one preventable factors or 25.4 per cent of the deaths. These included inadequate or delayed diagnosis and/or treatment, delayed, inadequate or no consultation and failure of family to seek or to follow medical advice.

TABLE VII. PREVENTABLE FACTORS IN 358 NEONATAL DEATHS
Hennepin County Perinatal Mortality Study, 1955

Factor	Number
Inadequate and/or delayed diagnosis	23
Inadequate and/or delayed treatment	37
Delayed or no consultation	7
Family did not seek and/or follow medical advice	24
Total	91 (25.4%)

For the first year of the perinatal study (1955) there are data on 255 fetal deaths. Table VIII presents the mothers' ages by weight of the fetus in grams. Table IX gives the types of delivery. Table X shows the maternal factors associated with the fetal deaths. There was a history of previous premature birth in thirty-four cases and of previous abortion in fifty-eight instances, occurring in 36 per cent of the fetal deaths. Among the maternal factors were abruptic placenta in sixty-two cases and antenatal bleeding of undetermined cause in thirty-five cases, totaling more than one-third of the fetal deaths (38 per cent). Toxemia occurred in twenty-nine, maternal diabetes in ten and prolapsed cord in nine cases.

Almost one-third (30 per cent) of the fetuses were macerated (Table XI). Congenital anomalies were found in thirty-three or 13 per cent, erythroblastosis fetalis in thirteen, and birth trauma and/or intracranial hemorrhage in fifteen cases.

TABLE VIII. MOTHERS' AGES IN 255 FETAL DEATHS BY BIRTH WEIGHT
Hennepin County Perinatal Mortality Study, 1955

Ages of Mothers	Weight of Infants in Grams					Total	Per Cent
	1000 and Less	1001-1500	1501-2000	2001-2500	Over 2500		
19 and under	7	5	2	1	2	17	6.7
20-24	13	4	9	4	18	48	18.8
25-29	14	11	7	11	32	75	29.4
30-34	18	6	7	7	20	58	22.7
35-39	8	4	4	7	17	40	15.7
40 and over	4	1	1	9	2	17	6.7
Total	64	31	30	39	91	255	100.0

TABLE IX. TYPES OF DELIVERY OF 255 FETAL DEATHS BY BIRTH WEIGHT
Hennepin County Perinatal Mortality Study, 1955

Type of Delivery	Weight of Infant in Grams					Total	Per Cent
	1000 or Less	1001-1500	1501-2000	2001-2500	Over 2500		
Cephalic	42	24	22	25	72	185	72.6
Breech	22	8	6	3	11	50	19.6
Cesarean section	1	1	2	5	11	20	7.8
Total	65	33	30	33	94	255	100.0

The first year of the study of fetal deaths shows that only 50 per cent had autopsies (Table XII). This is similar to the first year of the neonatal mortality study with 59 per cent autopsies and 51 per cent for those less than 2,500 grams in weight.

There has been a gradual decrease in the neonatal and fetal death rate as shown in Table I, but the study cannot take credit for this reduction because of the multiple factors involved. Credit can be taken for an increase in prenatal care, in Rh determinations, in an increase in the autopsy rate, in more complete clinical records and in the quality of care.

Some problems have been encountered in the study. The study was designed to be carried out

on the basis of voluntary reporting and submission of pertinent data by each hospital. In general, there was excellent cooperation but occasionally there was some difficulty in obtaining reports; more often the record was incomplete or inadequate. Some committee members have lost interest or have become too busy to devote the necessary time to the study. Periodic reports of the findings of the study, including serious errors of omission or commission, are published. But physicians do not receive individual reports of the findings or the criticisms of the committee. Thus, they are unaware of the conclusions of the committee as to their handling of individual cases. Both the maternal and the perinatal mortality committees use the educational approach rather than a punitive approach. Therefore, physicians should be informed of the committee's critical conclusions if the study is to be effective. The maternal mortality committee sends such reports to the attending physician as well as to the consultant concerned.

Since the Hennepin County Medical Society is the chief sponsor of the study and since with but one exception representatives of all participating groups are also members of this Society, suggested changes in procedure to make the study more effective were transmitted to the medical society for its consideration and action. The Board of Directors of the Society approved the following recommendations:

1. For the purpose of professional betterment, correspondence or personal visits may be undertaken between the perinatal mortality study committee and those physicians deemed by the study committee to have been guilty of serious errors of omission or commission.
2. Each hospital participating in the study should be invited to have a representative on the study committee.
3. Representatives of the State Board of Health may visit personally with attending physicians or the hospitals involved for the purpose of supplementing incomplete or inadequate records.

As to its acceptance and the advisability of continuing the study which is now in its fifth

TABLE X. MATERNAL FACTORS IN 255 FETAL DEATHS BY BIRTH WEIGHT
Hennepin County Perinatal Mortality Study, 1955

Maternal Factor	Weight of Infant in Grams					Total
	1000 and Less	1001-1500	1501-2000	2001-2500	Over 2500	
Previous premature birth	7	7	5	6	9	34
Previous abortion	11	6	8	11	22	58
Inadequate pelvis	0	0	0	0	1	1
Toxemia	4	7	3	5	10	29
Maternal diabetes	2	0	1	2	5	10
Abruptio placenta	14	8	10	10	20	62
Placenta previa	4	0	0	0	0	4
Antenatal bleeding, cause unknown	20	5	3	3	4	35
Prolapsed cord	4	0	2	3	0	9
Total	66	33	32	40	71	242

TABLE XI. PATHOLOGY IN 255 FETAL DEATHS BY BIRTH WEIGHT
Hennepin County Perinatal Mortality Study, 1955

Pathological Diagnosis	Weight of Infants in Grams					Total
	1000 or Less	1001-1500	1501-2000	2001-2500	Over 2500	
Birth trauma	1	0	0	1	4	6
Intracranial hemorrhage	4	0	0	2	3	9
Erythroblastosis fetalis	0	2	0	3	8	13
Maceration	17	12	13	13	22	77
Congenital anomalies	7	5	8	2	11	33
Central nervous system	(3)	(2)	(2)	(0)	(6)	(13)
Cardiovascular system	(1)	(0)	(1)	(0)	(0)	(2)
Respiratory system	(0)	(1)	(0)	(0)	(0)	(1)
Gastro-intestinal system	(0)	(0)	(1)	(0)	(1)	(2)
Genito-urinary system	(1)	(1)	(2)	(2)	(3)	(9)
Musculo-skeletal system	(2)	(1)	(2)	(0)	(1)	(6)

TABLE XII. AUTOPSIES BY BIRTH WEIGHT OF 255 FETAL DEATHS
Hennepin County Perinatal Mortality Study, 1955

Weight in Grams	Number	Per Cent
1000 or less	21	8.2
1001-1500	18	7.0
1501-2000	9	3.5
2001-2500	24	9.4
Over 2500	57	22.3
Total	129	50.4

year, on September 30, 1958, the Board of Directors of Hennepin County Medical Society approved the indefinite continuation of the perinatal mortality study with authority to the committee to select and appoint physicians with special interest in perinatal mortality.

Before concluding, it might be of interest to briefly discuss the differences in the approach used in our maternal and perinatal studies. The maternal mortality study employs a trained obstetrician-investigator who visits the hospital, abstracts the hospital record, and interviews key hospital personnel who were involved in the care of the patient. He visits the attending physician as well as any consultants concerned and completes a sixteen-page questionnaire. He thus has all the data available, including original records, laboratory reports, x-rays and tissue specimens or slides. A complete summary in chronological order is prepared for the consideration of the study committee. After action by the committee, a copy of the summary is mailed to the physician and consultant. It includes the decision of the committee as to the correct diagnosis, adequacy of medical and hospital care and laboratory procedures, completeness of records, necessity for consultation and the competency of the consultant, completeness of autopsy, as well as the preventability of the death and the preventable factors. This approach has been quite effective and well received. The study is so thoroughly carried out that it is actually an excellent postgraduate course in obstetrics and no one is willing to leave the committee voluntarily. As a result, it has gradually enlarged in size by the addition of new members to represent all parts of the state.

But the maternal mortality study involves only some fifty deaths. The perinatal study, in our largest metropolitan county, involves about 700 fetal and neonatal deaths and includes hundreds of physicians. To attempt to obtain such detailed and complete data on perinatal deaths would require a staff of investigators and a tremendous amount of time. To carry out interviews in an objective and impartial manner with the large number of physicians who provide obstetrical and pediatric care in Hennepin County would be quite difficult. To attempt to avoid criticism, directly or indirectly, would be almost impossible in many cases and would result in resistance, possible resentment and lack of cooperation on the part of the physicians concerned. The obstetrician-investigator for the maternal mortality study is instructed to obtain all pertinent information but he is not to express an opinion or any criticism of the handling of a case. He informs the physican that all conclusions are determined by the committee after careful consideration of all data and that a copy of the report will be mailed to him and his consultant.

It should be obvious that we feel that the approach used in the maternal mortality study is our most effective means of studying and reducing mortality. Nevertheless, in spite of the limitations outlined above, members of the Hennepin County Perinatal Mortality Study Committee believe that definite progress has been made and will continue to be made in the improvement of care in the perinatal period. The philosophy of the study and its objectives have been quite generally accepted. The committee has had the cooperation of the practicing physicians, the pathologists and the hospitals, in its efforts to reduce perinatal mortality.

One of the by-products of the pilot study has been the establishment of local studies in several out-state hospitals. Neonatal studies have been carried out at Willmar and Virginia, and for the past year a perinatal mortality study has been in progress in Duluth. A similar study is under consideration in Ramsey County which includes the City of Saint Paul. These studies are in cooperation with the State Department of Health, making it possible for local hospital studies to have the benefit of the statute which makes such studies confidential and protects all parties involved by not permitting such data to be admitted in court.

In conclusion, the perinatal mortality study committee has attempted to determine the primary cause of death in each case and to classify these causes in as meaningful a way as possible. It has emphasized the importance of autopsies to determine the actual cause of death, and it has been encouraged by the increase in the autopsy rate. In its progress reports and annual analyses the committee has endeavored to inform physicians of its findings, including errors of omission or commission, and has recommended means of reducing the recurrence of preventable factors. It feels that this educational approach must ultimately help to improve the quality of obstetric and pediatric care with a resulting decrease in mortality and morbidity.

Methamphetamine Sulfate in the Treatment of Nocturnal Epileptic Seizures

• Nocturnal epileptic seizures are controlled remarkably by methamphetamine sulfate given to patients just before bedtime. Patients with additional diurnal seizures were less well helped; in fact a few were worsened.

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PREVIOUSLY, we reported[1] a preliminary study on the use of Desoxyn® (methamphetamine sulfate) in a number of epileptic subjects. It was our conclusion that patients with nocturnal seizures, receiving the drug at bedtime, responded well to the therapy. This was in contrast to the cases where the patient experienced diurnal seizures; they manifested an aggravation in seizure frequency when this drug was administered during the day.

TABLE II. SUMMARY OF RESULTS WITH DESOXYN® IN NOCTURNAL EPILEPSY
Forty-one Patients

Result	No.	Degree of Control
Patients improved	28	2—complete control 6—80-90% seizure control 13—50-79% seizure control 7—20-49% seizure control
Patients with little or no change	9	6—no change 3—up to 19% seizure control
Patients aggravated	4	

The present study, which represents a continuation of the above work, further confirms our original impression on the effect of methamphetamine sulfate in nocturnal seizures.

Materials and Methods

A total of forty-one epileptic patients with nocturnal seizures were treated with methamphetamine sulfate (Desoxyn®) from three to fifty-four months (average 18.8 months) in the seizure clinic of the University of Minnesota Hospitals. All patients had had convulsions for many years with no evidence of progressive neurologic disease. The average number of seizures per month was 4.2 (0.2—thirty) while the number of nocturnal seizures ranged between 50 and 100 per cent of the total

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This work was aided by a grant from the Teagle Foundation.
Desoxyn® is a product of Abbott Laboratories, North Chicago, Illinois.

TABLE I. DETAILED RECORD OF THE EFFECT OF DESOXYN® IN NOCTURNAL EPILEPSY
Forty-one Patients

No.	Patient	Nocturnal Seizures Per Cent	EEG	Any Change on Previous Rx	Months of Rx on Desoxyn	Spells/Month on Desoxyn	Spells/Month Before Desoxyn	Spells/Month After Desoxyn Discontinued	Average Change in Seizures During Desoxyn Rx	
									Decrease in Spells Per Cent	Increase in Spells Per Cent
1.	B.S.	90-100%	Bil. Abn.	No	52	0.5	1.6		68	
2.	M.A.		Bil. Abn.	No	29	3.4	6.7	8.0	53	
3.	F.J.		Bil. Abn.	No	6	0.6	20.0		97	
4.	S.H.		Bil. Abn.	No	9	0.6	1.6		62	
5.	O.L.		Focal	No	18	2.7	2.3		87	
6.	B.D.		Bil. Abn.	Decreased	3	1.0	4.0	4.0	75	
7.	S.N.		Bil. Abn.	No	13	0	2.1		100	
8.	W.A.		Bil. Abn.	Decreased	7	0.3	0.7	0.3	40	
9.	F.T.		Bil. Abn.	No	10	1.1	2.1		47	
10.	K.T.			No	12	0.2	0.5		60	
11.	S.G.		Normal	No	15	0.2	0.3	0.2	20	
12.	B.R.		Focal	Slight Increase	3	0.3	1.3		76	
13.	S.S.		Bil. Abn.	No	45	0.6	1.0		40	
14.	A.W.		Bil. Abn.	No	10	1.0	0.5			100
15.	O.C.		Bil. Abn.	Decreased	7	5.7	10	9.0	40	
16.	R.L.		Normal	No	6	0.6	1.5	1.5	60	
17.	H.J.		Normal	Discontinued	43	0.1	0.3	0.2	60	
18.	L.L.		Bil. Abn.	No	23	1.9	2.1+	1.8+	0	0
19.	I.E.		Bil. Abn.	No	17	0.2	0.5		60	
20.	H.P.		Normal	Discontinued	35	0.03	0.3		90	
21.	W.J.		Bil. Abn.	Decreased	27	30.0	30.0		0	0
22.	H.I.	75-90%	Focal	No	15	11.2	13.3		15	
23.	C.A.		Bil. Abn.	No	14	0.3	2.0		85	
24.	E.G.		Focal	Decreased	5	3.0	5.6	1.6	16	
25.	M.P.		Bil. Abn.	No	21	0.9	7.1	0.1	75	
26.	W.J.		Normal	No	36	0.2	0.5+		60+	
27.	E.O.		Bil. Abn.	Increased	45	0	0.2		100	
28.	E.M.	50-75%	Bil. Abn.	No	38	1.4	1.4		0	0
29.	N.N.		Bil. Abn.	Decreased	8	0.3	2.7	1.2	80	
30.	L.G.			No	6	3.0	3.0	5.0	25	
31.	K.L.			Decreased	18	1.6	1.3	1.1		33
32.	D.S.		Bil. Abn.	No	3	1.0	1.0		0	0
33.	K.R.		Focal	No	15	3.6	5.6		35	
34.	O.L.		Bil. Abn.	Increased	3	30.0	30.0	33.0	1	
35.	D.A.		Bil. Abn.	No	20	5.2	4.0			30
36.	O.M.		Bil. Abn.	No	7	0.1	1.1		90	
37.	C.W.		Focal	No	54	0.3	1.0		70	
38.	P.M.		Bil. Abn.	No	6	0.5	0.5		0	0
39.	E.A.		Focal	No	26	0.9	1.5	2.1	50	
40.	R.A.		Focal	Decreased	16	0.9	1.0	1.0	0	0
41.	R.E.		Bil. Abn.	Decreased	26	2.4	11.0	9.0		22
	Mean values				18.8	2.7	4.2	4.6		

number of spells. There were twenty men and twenty-one women in the group. The ages ranged from sixteen to sixty-eight. The spells were mostly major motor and, to a lesser extent, other types. Laboratory studies, including skull roentgenograms, spinal fluid, and routine hematologic examinations, gave values within normal limits. All patients except one had negative blood serology. Glucose tolerance tests were performed in 70 per cent of the patients and were found to be normal except in two patients where the curves were diabetic. In two-thirds of the cases, pneumoencephalography was performed. This test was abnormal in only five patients, exhibiting a mild to moderate degree of ventricular enlargement. Electroencephalograms were performed in thirty-eight of the forty-one patients. All but five were abnormal. Methamphetamine sulfate in a dosage of 5 to 10 mg. given at bedtime, was added to the total daily medication which the patients were previously receiving. Although, in many instances, the amount of the previous drug was reduced, no attempt (except in two cases) was made to remove it completely.

The total number of seizures during methamphetamine sulfate trial was compared to the number of seizures reported during the same length of time prior to the institution of treatment with the drug. In seventeen of the forty-one patients, the seizure frequency during Desoxyn therapy was also compared to the frequency of spells over an equivalent period of time after this therapy was discontinued. In the evaluation of our results the total number of spells (both nocturnal and diurnal, if any) was considered.

Results

The results of this study are listed in Table I where a detailed record is given relating the effect of the drug to the frequency of seizures in the individual patient. In addition, the electroencephalographic findings, any change in the previous medication, and the number of nocturnal seizures are given for comparative purposes. Our studies in-

dicate (Tables I and II) that twenty-eight of the forty-one patients studied showed an improvement in the frequency of the seizures; nine exhibited no significant change; while four had an increase in seizures. Among the twenty-eight patients who showed improvement, in nine the previous anticonvulsive medication was reduced by at least one-third during the methamphetamine sulfate therapy. Four of these patients continued to show a good response, three had no significant change whereas two manifested an increase in the frequency of their daytime attacks. In two patients, exhibiting 90 per cent or more of their spells at night, the previous medication was completely discontinued and the patients obtained a better seizure control on the methamphetamine, alone, than on their previous medication. The more frequent the diurnal seizures were, in addition to the nocturnal ones, the less responsive the patients were to the methamphetamine therapy (Table III).

Among thirty-three patients exhibiting abnormal electroencephalograms, twenty-five revealed non-focal patterns characterized by more or less paroxysmal bilateral changes. In over half of the cases, these were synchronous in appearance.

Discussion

The observations presented above suggest that the usage of methamphetamine sulfate and probably other amphetamines should be considered as an adjunct in the management of seizure patients manifesting nocturnal attacks. A report in the literature of one patient with nocturnal seizures controlled with benzedrine[2] is in accordance with our observation. Since our preliminary work[1] suggested an aggravation of diurnal seizures by methamphetamine, no attempt was made either to give this drug during the day or to withdraw the previous medication, except in two cases. It was found of advantage to administer the drug just prior to the time the patient falls asleep. It has been our experience that patients with nocturnal seizures rarely complain of any disturbances in the pattern of sleep if the drug is administered in this manner.

The electroencephalographic changes in the majority of our patients, characterized by bilateral paroxysmal patterns, suggest the presence of deep-seated epileptogenic lesions discharging to both hemispheres. We were unable, however, to distinguish any electrical abnormality pathognomonic for nocturnal epilepsy.

The mechanism by which amphetamines are effective in treating nocturnal seizures, as well as the possible pathophysiologic patterns involved in nocturnal epilepsy, were discussed extensively in our preliminary report. As more recent studies[3] indicate, the site of action of amphetamines appears to be at the brain stem reticular activating system. It is possible, therefor, that the indirectly-induced dissynchronization of electrocortical activity by stimulation of the activating reticular system by the amphetamines, produces a lighter sleep and consequently maintenance of cortical inhibition over subcortically-arising epileptic discharges.

TABLE III. EFFECT OF DESOXYN® ACCORDING TO PROPORTION OF NOCTURNAL SEIZURES
Forty-one Patients

Nocturnal Spells Per Cent	Patients Improved Per Cent
90-100	66
75-89	70
50-74	43

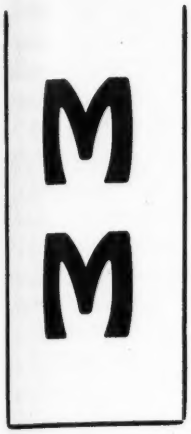
Summary

1. Methamphetamine sulfate in a dosage of 5 to 10 mg. at bedtime, was found useful in the treatment of nocturnal seizures in twenty-eight of forty-one patients suffering from epilepsy.

2. The electroencephalographic patterns in these patients suggest that subcortical epileptic foci may be responsible for nocturnal epilepsy. Methamphetamine probably derives its anticonvulsive effect in nocturnal spells through its effect at the brain stem reticular activating system.

References

1. Logothetis, J.: Desoxyn therapy for nocturnal seizures. A preliminary report. Neurology, 5:236, 1955.
2. Caveness W.: A therapeutic approach suggested by the coexistence of sleep and convulsive disorders. IV Cong. Neurol. Intern., 2:128, 1949.
3. Bradley, P. B., Elkes J.: The effects of some drugs on the electrical activity of the brain. Brain, 80:77, 1957.



● Are our courts today placing the medical profession in a position of constant defense and insecurity? If the lay public can file suit for "assault and battery" as well as "unauthorized treatment," and if a lay jury can decide a case on the basis of *res ipsa loquitor*, then as the author states, it is time for our legislature to enact some changes in the present laws and their interpretation.

When a physician is afraid to employ certain useful techniques because of the possibility of malpractice litigation, then it is apparent that the patients will be the losers.

The author also lists the six principal causes of lawsuits against physicians.

A Medical Legal Problem

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IN 1905, the Supreme Court of the State of Minnesota decided the case of *Mohr vs. Williams*. From time immemorial suits against physicians had been predicated on the legal theory of negligence. The term negligence as applied to a physician was referred to as malpractice. As a general proposition to prove that a physician was guilty of malpractice, it was necessary to establish by competent evidence that the physician failed to use the standard of care ordinarily exercised by physicians in the community in which he prac-

Address presented before the Minnesota Academy of General Practice, Minneapolis, October 22, 1958.

ticed. This rule came into being in the English Common Law and received the studied opinions of many competent jurists.

It has been contended by certain members of the legal profession that this rule was too harsh inasmuch as many deserving plaintiffs, who had been damaged by negligent treatment, were unable legally to establish their claim because of the reluctance of physicians to testify that the act of the defendant physician was not in conformity with the standards of care in the community. As a consequence, the legal profession began seeking means of permitting lay juries to pass upon the conduct of a physician based upon result, rather than theories of law which had proved sound throughout the centuries.

Any unauthorized touching of a person's body constitutes assault and battery in legal contemplation. There are exceptions to this rule, such as an emergency medical procedure. In the *Mohr* case the physician had diagnosed difficulty in the patients right ear. In surgery it was discovered the trouble was in the left ear. The doctor proceeded surgically to repair the difficulty. Following the operation the patient sued the doctor on the theory of "assault and battery" contending that she had not consented to the operation upon her left ear. It was apparent no authorization for an operation upon the left ear had been obtained, hence, a lay jury was permitted to consider the question of damages for assault and battery. The result was a verdict for the plaintiff in the sum of $14,322.50. The Supreme Court set the verdict aside on the ground that it appeared the jury had been influenced by passion and prejudice and directed a second trial. This resulted in a verdict of $3,500.00. The trial court set this verdict aside as excessive. An appeal was taken and a third trial ordered. At this point, the harassed physician settled the matter rather than incur further legal expense and exposure. All this for having performed a successful and beneficial operation.

In analyzing the defendant's position, it would appear he could only have escaped his predicament by awakening the patient from the anesthetic during the course of the operation. After determining that the patient was in full possession of her faculties, he then would have had to secure her consent to the procedure performed.

In a well considered article by Professor Allan H. McCoid, entitled "A Re-Appraisal of Liability for Unauthorized Medical Treatment," 41 *Minnesota Law Review* (1957), he analyzes the ridiculousness of the "assault and battery" or "unauthorized medical treatment" theory and suggests that a physician's responsibility to his patient should still be tested by the rule of malpractice.

The Minnesota court, however, in applying the principle of assault and battery or unauthorized operation theory, opened the door for the application of liability without fault. It would seem that the *Mohr vs. Williams* case did not create much legal significance in this state. However, Oklahoma adopted the principle quoting the *Mohr vs. Williams* case as authority. Other states followed. When the rule was advocated in North Carolina, quoting the *Mohr vs. Williams* case as authority, the Supreme Court of that state rejected it, stating that to adopt such a rule would require the physician to maintain a set of well organized plans and specifications authorized by his patient and filed in his office safe for every medical procedure.

In 1955, Helmer and Nita Bang sued Dr. Frederic Foley, the eminent St. Paul urologist, for alleged damages resulting from an unauthorized operation by Dr. Foley. The plaintiff Helmer Bang sought general damages of $100,000 and $50,000 in punitive damages. The wife Nita Bang sought $25,000 general damages and $15,000 in punitive damages. It was claimed that Dr. Foley had without authority performed a vasectomy. At the first trial plaintiff, in response to cross-examination, admitted that he had authorized Dr. Foley *"to do everything that was necessary in order to treat his urinary retention difficulties."* The trial court directed a verdict in favor of Dr. Foley on the theory that this general consent gave the physician implied authority to perform an operation as in his good medical judgment was necessary to effect a cure of the patient's condition. The Supreme Court reversed the case and held that under the record of the first trial, it would appear a better rule should be adopted and that in such circumstances, the following rule should be applied:

> Where alternative medical procedures exist the physician shall inform the patient of such alternatives and permit him to make the choice.

In other words, a general consent from the patient to do what in the physician's judgment is necessary will not protect the physician from liability.

It may be argued there is a saving clause in the

opinion, wherein the court stated that for purposes of the case at bar the rule should be applied. However, on the second trial of the *Foley* case we had an opportunity to try and apply the rule. Upon re-trial, plaintiff contended he had not even consented to an operation upon his prostate. When he talked to Dr. Foley it was agreed that Dr. Foley should do everything that was necessary, but he, the patient, was talking about his bladder and not his valuable prostate gland! Fortunately, the lay jury exonerated Dr. Foley. Nevertheless, the jury was permitted to pass on whether there was consent to operate upon the prostate gland as well as the question of unauthorized severance of the vas deferens.

Imagine a physician describing to his patient the alternatives of every medical procedure. How can the physician make the patient understand all of the alternative procedures? In a rather humorous manner, I think this situation is best described by a letter I received from Dr. Foley after he had attempted to analyze the application of this rule as he saw it from the physician's viewpoint.

Protection of himself against the evils of this decision will require the physician to explain to the patient every fact and circumstance surrounding his pathologic condition and the actions the physician may take as indicated by them for the patient's welfare.

Innumerable facts and circumstances of this sort and the common practice of physicians in dealing with them point out the fallacy of the rule which this decision establishes. In the presence of this rule and with thought for his own safety the physician would have to have a preoperative discussion and obtain multiple permissions for operation which would go like this:

2:00 P.M. I should explain to you, patient, that your symptoms are due primarily to your prostate gland and are of a mechanical nature, that is mechanical obstruction to your passage of urine through the prostate gland.

However, other structures of your genito-urinary system besides your prostate and conditions other than mechanical obstruction to urination are involved in your trouble and any operation on your genito-urinary system which may be employed to give relief of your trouble. You must understand that the proposed operation will be an operation on your genito-urinary system, not merely on your prostate gland.

For example, your water passage, or urethra as it is called, far beyond and below your prostate will be stretched, dilated with dilating instruments as a part of the contemplated operation on your genito-urinary system. This dilatation of your urethra may lead to periurethral abscess formation with febrile illness. It is a bad postoperative complication and may be serious or even fatal.

The contemplated operation is called transurethral resection. You may be cared for by another form of operation: suprapubic prostatectomy. In performance of that operation instrumental dilation of your urethra would not be done and would avoid the possible ill effects of that. But the consensus of opinion is that transurethral resection, even accompanied by instrumental dilatation of the urethra, is a safer method and carries less risk to life and risk of serious complications and is the safest form of operation.

I should explain to you that your bladder connects with your prostate gland and that in removing the obstructing portion of your prostate, a part of your bladder floor will also be removed.

Almost invariably an obstructing prostate is infected. Spread of that infection is the greatest danger attending operation. One avenue of infection spread is through the ducts or cords going from the prostate to the testicles. Spread of infection through these ducts or cords may lead to inflammation and abscess formation in the testicles and could result in loss or one or both of your testicles. Loss of your testicles would not only render you sterile, but also would leave you with no sexual desire, no erection of your penis, and incapable of performing the sexual act. That would cause your wife loss of your "consortium."

To avoid such disasters the result of this operation on the genito-urinary system one step in the operation is to sever the ducts connecting the prostate to the testicles. This makes impossible spread of infection from prostate to testicles with these disasterous results.

Division of these ducts or "cutting the cords" as this part of the operation is called, in non-technical language, has no unfavorable effect on your sexual desire or ability to perform the sexual act and will not rob your wife of your "consortium." The only effect of cutting your cords will be to prevent spread of infection to your testicles. If "cutting your cords" were not combined with excision of your prostate it would also have the effect of making you infertile (sterile). Since excising your prostate will make you sterile, it cannot be said that "cutting your cords" is responsible for it.

In considering infertility (sterility) which can be effected by "cutting the cords" you must bear in mind the fact that excising the obstructing tissue of your prostate—the chief feature of this operation on your genito-urinary system—will by itself render you sterile without "cutting your cords." So even without "cutting your cords" the excising of the obstructing part of your prostate will make you sterile and incapable of rendering pregnant your wife or any other woman.

How excision of the obstructing portion of the prostate causes sterility is a simple matter. This excision of tissue from the prostate destroys the internal sphincter of the bladder which closes off the bladder from the water passage going downward through the substance of the prostate gland. At climax of the sexual act, in the male, this internal sphincter muscle contracts tightly closing the communication between bladder and water passage. This closure causes the ejected seminal fluid to pass outward through the water passage, or urethra as it is called, into the wife's vagina. When the internal sphincter has been

destroyed by excision of the obstructing prostatic tissue there is free communication which cannot be closed off because of the destroyed sphincter between bladder and water passage. As a result the ejected seminal fluid instead of going outward into the wife's vagina, goes inward up into the bladder. The seminal fluid thus ejected into the bladder will be seen floating in the urine first voided from the bladder following the sexual act.

Following this operation you, and perhaps your wife too, will be conscious of the fact that climax of your sexual act is not accompanied by ejection of seminal fluid from your penis into her vagina. Sometimes this observation is disturbing and alarming to both husband and wife. Very frequently husbands who have had this operation, question me about this effect of the procedure. I explain the situation to them as I have explained it to you and point out that it is a normal and always produced effect of the operation. That satisfies them and quiets the disturbance and alarm they and their wives may have felt. I might also explain to you, patient, that this absence of "ejaculate" as it is called, has nothing to do with "cutting the cords" going to the testicles for the seminal fluid is not formed by the testicles. It is a secretion of the epithelial cells of the seminal vesicles, two glands which lie under the bladder and connect with the water passage by way of ducts. These ducts go through the substance of the prostate to reach the water passage. The seminal fluid secreted in this way accumulates in the seminal vesicles and is stored there between performances of the sexual act. At climax of the man's sexual act, the seminal vesicles contract and the seminal fluid which has accumulated in them is forcefully ejected into the water passage. At the same time the internal sphincter muscle contracts tightly and closes off the bladder from the water passage which forces the seminal fluid to go outward. A prostate operation destroys the internal sphincter. This leaves the water passage in open communication with the bladder. This communication is the path of least resistance and the seminal fluid passes upward into the bladder instead of going outward into the wife's or somebody's vagina.

Two other features of this situation must be explained to you if you are to have a clear understanding of what is involved, and give me permission to do all the procedures which are required for your proper surgical care, avoidance of complications and safety.

The first of these is the pubic and scrotal hair of your genital region which will be in the field of operation. It is not possible to sterilize this hair to make the field of operation free of germs. Not sterilized genital hair might lead to infection, just as your spermatic cords might transmit infection from your prostate to your testicles if I failed to "cut your cords." So as part of the operation on your genito-urinary system your genital hair will be cut along with "cutting your cords." Some men consider this "hair cut" a disfigurement, find it distressing and complain of it while their wives may feel it impairs "consortium."

And finally there is your blood. Your blood is no more an integral part of your genito-urinary system than any other part of your body. In spite of that it is an integral part of this operation on your genito-urinary system, just as your "cords" and genital hair are parts of it. Even in the absence of any emergency made by fall of blood pressure or other indication of surgical shock, blood transfusion is almost regularly employed in an operation of this sort on the genito-urinary system as a safety measure to avoid postoperative complications, just as the genital hair and "cords are cut" for this purpose.

Say, by the way, patient, are you a Jehovah's Witness? If you are and I gave you a blood transfusion without your permission, you would probably sue me on the ground of assault. Members of the Jehovah's Witness cult will not permit themselves to be transfused with blood—would prefer to die.

There should be clear understanding between us in all of these matters. I should know to which church you belong and I should know that you clearly understand all steps of the genito-urinary operation to be performed and should have your permission to perform them so that performance as parts of this long standardized and practiced genito-urinary operation for relief of prostatic obstruction will not be regarded as an assault upon your person.

So, patient, it is up to you to decide if you wish to be operated upon, what form of operation you wish to have, and if you wish to have me do all I can to avoid possible complications—such as loss of both of your testicles. There is no emergency or urgency about this and it is up to you to decide what form of operation you want and whether or not you wish to be operated upon at all. The trouble you have is not of grave nature, formidable, or critical, and will not be fatal within the immediately foreseeable future. So if you wish not to be operated upon you may do so safely—there is no emergency about it.

6:30 P.M. Sorry, patient, it is after six o'clock and there are still ten patients waiting to see me.

So now, look: here is a form for you to sign giving me permission to make this operation on your genito-urinary system including particularly your permission to give you: (1) a prostatic resection, (2) a hair cut, (3) a cord cut, (4) a partial excision of your bladder floor, (5) a dilatation of your urethra, (6) a blood transfusion.

But before you sign, you must realize that the cords, the water passage below your prostate, the bladder floor, the genital hair and your blood are not parts of your prostate gland which is making your trouble.

On the form I have given you, you will note that below your signature giving the required permission is a statement above my signature in which I agree to make this operation on your genito-urinary system in accordance with the standardized form of operation long practiced and not fail to carry out any part of that procedure which would be for your benefit and safety and for which you have given specific permissions.

While you are looking through this form, I hope you will excuse me while I tell the patients in the reception room, who have been waiting there during most of the afternoon while I have been talking to you, to go home and come back tomorrow.

Needless to say, doctors themselves do not agree upon medical procedures and a strict application

of the rule would substitute the patient's judgment for that of the physician. Moreover, I wonder if the patient wants to know the mortality statistics and all the details of every medical procedure. If such a rule is to be followed, how can 170,000 doctors treat 170 million people? Most of their time would be spent in educating their patients on the intricate details of medical science.

I think the following example demonstrates the necessity for abolishing the "assault and battery" rule: Plaintiff fell off a farm wagon in 1944, and struck the back of his head, neck and shoulders on the wagon. No serious consequences appeared at the time, but about a year later periodic headaches set in which had become constant and unbearable by October 1948. After consulting a doctor in the city where he lived, plaintiff on November 30, 1948, went to an Ohio hospital for examination and treatment, being placed under the care of the defendant Dr. A. After two days of conservative treatment, which proved ineffectual, Dr. A performed a spinal column operation on December 3. At this operation Dr. A was assisted by Dr. B, who in Dr. A's absence had charge of plaintiff from that time on, and he examined him at various times and made notations in the hospital records. The operation was a cervical laminectomy. The laminectomy consisted of the removal of the spinus processes of the first four cervical vertebrae to give access to the spinal canal.

Plaintiff's recovery from this operation was uneventful and he was discharged from the hospital on December 13 and returned to his home under instructions to get up and around a few minutes each day. However, on December 25 his headaches returned and a week later, on December 31, he came back to the hospital for further observation and treatment. On January 1, 1949, Dr. B, in the course of making his regular round of visits, came to plaintiff's bed and after questioning him as to what had happened while he was at home, asked him if he would sit up, first in bed, then on the edge of the bed, which he did. Dr. B then asked him to turn his head from side to side, but plaintiff complained that this movement caused him pain, whereupon Dr. B remarking that he could surely turn his head more than three-fourths of an inch, put his hands on the side of plaintiff's head and turned it from side to side twelve or fifteen times, this being in spite of plaintiff's protests and resistance.

Dr. B then said, "I want to see his reaction on his feet," and so the doctor helped him on with his slippers and robe, walking back of plaintiff and cupping his hands in plaintiff's hands. When plaintiff still continued to resist, Dr. B said, "You just don't seem to want to try to get well. Don't you want to get well?" In this fashion Dr. B got plaintiff out into the hall and they walked down the hall some thirty feet. Dr. B then took his patient over next to the wall saying, "I want you to walk. You keep trying to walk." Thereupon plaintiff claims that Dr. B left him, and his wife and another woman had to lead plaintiff back to his room and to bed. The hospital records contain the following notes by Dr. B relative to this occurrence:

> The patient has not been out of bed since he left the hospital. Neurological essentially negative except for surgical analgesia as noted. History obtained from wife revealed patient had a very good friend operated on in Indianapolis, Indiana, who died a few hours post-operative; since then patient has continually cited severity of his operation. States that he has pain in the analgesic area but yet unable to feel a pin. He resents close questioning as to his condition and states he cannot walk. I urged him to get out of bed and he exhibited a pseudo-ataxia and then became quite angry because he had to get out of bed. The nurse observed him while I answered a phone call and he told her he was going to get out of here because he could not understand his condition. With that remark the ataxia disappeared and he ambled over to his bed. Impression—conversion hysteria.

The foregoing occurrence furnished the entire basis of plaintiff's $128,000 suit for malpractice against Drs. A and B.

In his argument to the jury, counsel for plaintiff frankly stated:

> I should like to state now once and for all and without the slightest equivocation, the essence of our case is assault and battery. Mr. Horn, defense counsel, says that we have not proved negligence. We have not attempted to prove negligence. We do not take the position that this is a negligence case. Whatever malpractice was committed here we insist was a malpractice by reason of doing a completely unauthorized act not a negligent act, an unauthorized act.

Plaintiff's contentions were:

1. Dr. B's treatment of his patient, the plaintiff, on the occasion in question, was not consented to by the plaintiff, but on the contrary was opposed and resisted by him; hence he was unauthorized and in law amounted to assault and battery.

2. Consequently, there having been willful assault by Dr. B, medical evidence was unnecessary and the nature of the occurrence was such that lay testimony was sufficient for a jury of laymen to find Dr. B guilty of malpractice.

Defendant's contentions were:

1. By voluntarily becoming a patient at the hospital the plaintiff gave his consent not only to the operation performed on him, but also to any and all postoperative treatment which the hospital doctors, including Dr. B, in good faith, deemed necessary for his recovery. For this reason Dr. B's treatment on the occasion in question was not unauthorized nor did it amount to an assault and battery; it had been consented to in advance and his consent lasted as long as he remained a patient at the hospital;

2. Except in rare cases malpractice must be established by medical evidence and not by lay testimony and while there exists an exception that under certain circumstances lay testimony is sufficient, the case at bar falls in the rule and not within the exception.

The trial court directed a verdict in favor of both defendants. In doing so the trial court made these comments:

> But here is a doctor who has to find out just how much flexibility the patient has, whether he actually can stand or not, or whether or not he can walk, so he moves the man's neck around a little to see how much numbness there may be there or somewhere else. So he tries to help the gentleman to move his head a little, and he didn't like it and he protested and he hollered. Well, I suppose that his head had stayed still in the three weeks that he had been home except once a day he probably got up. Can I say as a layman, that his present condition and everything he has gone through, was caused directly by or would not have happened except for what Dr. B had done this day?
>
> Now, that is exactly what is expected of these trial jurors as laymen, to say without medical help or without medical testimony, from their own knowledge and experience, and the average of them would not have any more than I would have.
>
> Now then, suppose that your little child is sick with constipation, and you say, "Willy, step up here and get a dose of castor oil." Willy says, "I don't want it." And you say, "You have to take it." So you hold his nose and give him the tablespoon of castor oil and Willy screams. Is that assault and battery? Am I supposed to let this go to a jury of twelve laymen who will say that the doctor who tried to help him on this occasion by moving his head and getting him to his feet is the cause of it all and he ought to pay for it all?

However, the Court of Appeals reversed the judgment of the trial court as to Dr. B stating:

> It is the unanimous opinion of the members of this court that plaintiff's evidence discloses a course of conduct upon this occasion by defendant Dr. B constituting a technical assault and battery upon plaintiff, a very sick and weak man, with resulting injuries. It is a contention of defendant's counsel that the patient, by entering the hospital and submitting to treatment, gave implied consent to anything which might occur, such as the conduct here considered.
>
> This rule has no application to the facts and circumstances here indicated by the evidence presented by the plaintiff in the instant case, where the patient and his wife protested vigorously against the conduct of the physician. In the absence of evidence to the contrary, the vigorous but unavailing protests of plaintiff and his wife, constituted an express refutation taking precedence over any implications arising from the fact plaintiff submitted to treatment by the hospital. Further, it is our view that the question of consent, either express or implied, under the circumstances was a question of fact for the jury under proper instruction.
>
> In our opinion, upon plaintiff's evidence, the treatment accorded the plaintiff upon this occasion by the physician was unauthorized thus bringing the case within the exception to the general rule that expert medical testimony is necessary to support a case against a physician for negligence.

As was observed by the trial court, the practice of medicine is replete with instances of these alleged assaults. One has but to sit in a dentist's or a doctor's waiting room, or walk down a hospital corridor to hear the protestations of the patients against the often painful but usually necessary treatment of the doctor attempting to help the patient beyond immediate pain to final recovery. If the natural reticence and understandable objections of the patient to every necessary but painful treatment adhered to by the doctor is to convert treatment properly deemed necessary by the attending physician into a technical assault and battery, actionable in law *per se*, without regard to negligence, then the practice of medicine will have to be drastically curtailed. Yet, this is what the decision of the Court of Appeals clearly implies, for it renders the doctor liable without fault for the technical assault thus committed and renders him an insurer of all subsequent events the lay jurors may decide they think resulted from such treatment. If this decision is to be the law, then the doctor will have to forego many vitally necessary treatments at the first painful outcry from the patient. Surely our courts must learn to take a more realistic view of the medical facts of life. If

the progress of medical science is not to be seriously curtailed, I submit that our courts must take a more realistic view of the situation and require medical proof of negligent treatment if the ultimate interests of the public are to be served and medical science advanced.

Another example of the liability without fault theory in malpractice cases is the so-called *res ipsa loquitur* doctrine. Notably this doctrine has been adopted by the state of California in certain situations where a physician's negligence is claimed. As a general statement, the law of California in adopting this doctrine permits lay juries to pass upon the liability of a physician where a bad result has occurred purely upon the basis of the result. The theory of *res ipsa loquitur* is that where the factors which result in the harm are under the sole control of the defendant, it is permissible to allow a lay jury to decide whether or not the harm resulted from negligence by the defendant. The Supreme Court of California has said that they adopt this rule in specified cases because of the reluctance of physicians to testify against each other.

In an effort to cure what has been so loosely described as the physician's closed-mouth policy, certain states, notably California, have adopted liberal policies to permit lay juries to pass upon a physician's responsibility to his patient where there has been a bad result. The abhorrence and sympathy for the patient's condition strongly influences the laymen, and injustice must follow. Here is an example.

This case arose out of the following circumstances: The plaintiff, a fifty-four-year-old man employed as a stock clerk, had suffered intermittent claudication in the calves of both legs for about a year. He had been attended by a specialist in internal medicine who treated him conservatively with drugs intended to improve circulation. When the patient did not respond, he was referred by the internist to the defendant doctor, a specialist in vascular surgery. The defendant doctor examined the patient and found complete absence of pulsations from the femorals down. The patient had all the other signs of an obstruction in his aorta and the defendant doctor recommended that he enter the defendant hospital for further studies to determine if an operation could be performed to improve the patient's condition. The plaintiff claims he understood he was entering the hospital merely for some routine x-rays. Up to this point, the patient had no sensory or motor nerve disturbances.

The patient entered the hospital on January 6, 1954. He was examined by a resident in surgery and x-rays of the chest and abdomen were taken with barium swallow. The next day, the patient was scheduled for translumbar aortography, but this was postponed until the afternoon of January 8, 1954. The patient was taken at that time to the x-ray department. The defendant doctor was present at the very start of the procedure, but did not participate in it. He left the room after a minute or two. The patient was given an anesthetic by an anesthetist. A resident in surgery inserted a 16-gauge needle into the aorta in the usual manner without difficulty. Thirty cc. of sodium urikon were injected through the needle and a series of films taken. Upon examination of these films, with the patient still under anesthesia, the resident in surgery, after conferring with the radiologist, decided that an additional run should be made in an attempt to visualize collateral circulation lower down on the body. An additional injection of 20 cc. was made without changing the position of the needle. The patient was returned to his room, apparently in good condition. The next morning about 5:00 a.m. it was found that the patient was completely paralyzed from the umbilicus down. He had a transverse myelitis which unquestionably was permanent in nature. Complete paralysis of the lower extremities, bowels and bladder were present. The patient was a permanent paraplegic.

The plaintiff's first complaints at the trial were that the defendant doctor himself did not perform the procedure as the patient had expected, but that it was done by an allegedly inexperienced resident. (In fact, the resident had considerable experience, but this was difficult to establish.) The patient complained that he was not advised in advance of the procedure that there were any risks or dangers attendant to it. There was a claim that 50 cc. of sodium urikon was too much and exceeded the recommended dosage of the manufacturer's brochure, which was 15 cc. He also complained of two runs being taken.

At the trial it was difficult to establish what in fact caused the paralysis, as there is very little in the literature concerning such a complication, although a few have been reported. It was the defendant doctor's opinion, and that of another expert, that there had been an occlusion of the blood supply to the spinal cord which resulted in necrosis of the cord. The third expert, a neurosurgeon, was of the opinion that the complication was due to a toxic reaction to the drug.

At the trial it was demonstrated that the patient would require paraplegic care for the remainder of his life. Plaintiff's expert testified that he had a normal life expectancy of about twenty years. This, of course, was contrary to the findings demonstrated by the aortogram, which showed an almost complete block of the aorta very close to the take-off of the renal arteries.

There was no direct testimony that standard practice was not followed either by the hospital and its employees or by the defendant doctor. An independent medical expert called on behalf of the plaintiff to testify was not permitted to express an opinion on the standard practice in the community in the performance of aortography, on the ground that he was not qualified in the field.

The trial court denied defendants' motions for a nonsuit and directed verdict on the theory that the doctrine of *res ipsa loquitur* was applicable and submitted the

case to the jury on this doctrine. The court did not require proof of negligence by the plaintiff. In applying the doctrine of *res ipsa loquitur* to the case, the trial court instructed the jury that there was a presumption or inference of negligence from the untoward result which it was incumbent upon the defendants to explain away. The trial court's instructions, in effect, made the attending physician responsible for practices without untoward results, even though he was not in attendance at the time.

The jury rendered a verdict in favor of the plaintiff against both defendants in the sum of $250,000. This was reduced by the trial court to approximately $215,000 and the case was appealed by both defendants.

One has to sympathize with the defendant doctor. The risk at $250,000 is too great a one for him to be asked to assume. If this is to become the law, it is apparent that the patients in the progress of medical science—not the doctors—are to be the losers. Under the pressure of such odds, the doctors will simply cease to employ such techniques regardless of their benefit to the patient and regardless of the fact that, statistically, serious complications are rare.

In a discussion of this case, a leading Cleveland orthopedic surgeon stated that the medical profession is already retrenching along this line, foregoing many useful techniques for fear of a court and jury imposing tort liability without fault, and that malpractice litigation is now considered by the medical profession as an occupational hazard so great even as to affect adversely current medical school enrollment.

It has been reported in *Newsweek* magazine of July 11, 1955:

Some five thousand cases are now being tried each year with thousands of other cases settled out of court. Since 1950, one out of every thirty-five doctors insured under the New York State Medical Society's group insurance plan has been sued in the courts for malpractice.

The chairman of the District of Columbia Medical Society Professional Liability Insurance Committee (where recently 115 malpractice cases were pending and the doctors found all group insurance withdrawn from them) states:

Only about one in seven or eight of the District cases shows any voluntary negligence on the doctor's part nonetheless the doctor loses about one in four cases.

Fortunately, our Minnesota courts have refused to adopt the *res ipsa loquitur* theory.

In May of 1957, Arthur Snyder from the Chicago Daily News Service reporting for the American College of Surgeons, stated the following as the principal causes of lawsuits against physicians:

1. Failure of a doctor to call in a consultant when progress is poor.
2. Allowing the patient to become over-optimistic about the outcome.
3. Failure to obtain proper written consent to perform an operation.
4. Critical comments of one physician about the work of another.
5. Failure to obtain understanding with the patient in advance of the cost of care.
6. Failure to have a nurse or other professional attendant in the room during the examination of a woman patient resulting in suits for undue familiarity.

While the patient still respects the doctor's authority, says the College, at the same time today's patients are more knowledgable and sophisticated than were the patients of an earlier generation.

In order to correct the evils of the "assault and battery" or "unauthorized treatment" theory, two courses are open to the medical profession: (1) Legislative enactment and (2) Re-consideration by the Supreme Court.

I suggest the medical profession urge the legislature to adopt the following act:

In the absence of an emergency, any patient, or guardian or parent of an incompetent or minor patient, who shall give a physician or surgeon a general consent in writing to perform medical treatment will be deemed to have authorized such physician or surgeon to do all things necessary which in the judgment of the physician or surgeon are required for the welfare of the patient. Nothing herein stated shall relieve the physician or surgeon from performing the treatment in a skillful manner commensurate with the recognized standard of good medical practice.

As an English court said in 1954:

We should be doing a disservice to the community if we imposed liability on hospitals and doctors for everything that happens to go wrong. Doctors would be led to think more of their own safety than of the good of their patients. Initiative would be stifled and confidence shaken. A proper sense of proportion requires us to have regard to the conditions in which hospitals and doctors work. We must insist on due care for the patient, but we must not condemn as negligence that which is only misadventure. . .

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Recurrent Mixed Tumor in the Buccal Mucosa of a Seven-Year-Old Boy

A relatively common tumor made rare because of its location in a child.

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MIXED TUMORS of salivary gland origin have been of particular interest for many years and debate still rages about their origin, degree of malignancy and treatment. These tumors are not common, their incidence being below 1 per cent of hospital admissions, but they occur in a significant number of patients with tumors of the head and neck. They can be classified into those that are definitely benign and those that are definitely malignant, but the largest and the most controversial is the group of mixed tumors which are benign yet may recur after surgical excision and even become malignant. It is not possible to determine microscopically which tumors will recur but the more cellular tumors apparently have more potential in this respect.[1]

The pathogenesis of these tumors has been a controversial subject for many years. At first it was thought that they were purely epithelial in origin. Later the endothelial theory was introduced by Wortman but was soon abandoned and the epithelial theory generally accepted, particularly since the investigations of Kennan and Fry. The great majority of investigators agree

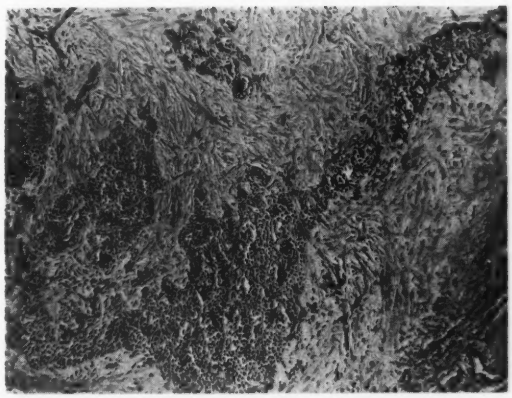


Fig. 1. Photomicrograph taken June 13, 1957. The section is composed of medium-sized epithelial cells arranged in nests and cords with scattered areas of cartilage formation.

that microscopically these tumors are mixed in the sense that they contain both epithelium and connective tissue stroma, the predominant element being the epithelium which appears in the form of interlacing strands, convoluted columns, solid nests, cribiform nests and acini separated by various amounts of fibrillar and myxomatous tissue or hyaline cartilage.

These tumors may be found in various parts of the orofacial region. In most reports, the distribu-

tion is as follows: parotid gland approximately 90 per cent, submaxillary gland 10 per cent, sublingual glands less than 1 per cent, and occasionally they are also found in the lips, cheeks, palate and the floor of the mouth.

The clinical course is variable. In the majority of patients, the history is of a slowly growing or stationary lump. A small percentage of mixed tumors cause some local discomfort, a vague sense of pressure or pain at the tumor site. In the retromandibular tumors, pain may be referred to the ear. Recent reports indicate that the presence of pain as well as rapid growth are indications of possible malignancy. Benign mixed tumors of the parotid gland, even those that reach large size, very seldom cause paralysis of the facial nerve in sharp contrast to what may be expected in cancers.

Despite the fact that these tumors are extremely uncommon in the earlier years of life (being most common in persons between twenty and forty years of age), there are scattered reports of their occurrence in early childhood and infancy. The reports indicate that from 1920 to 1950 there have been 2,309 cases of mixed tumors reported in which the age of the patient was stated. Included in these reports are sixty-six instances of mixed tumors in children.[2]

Following is a case report of possibly the youngest patient ever to have had a mixed tumor of *buccal* salivary gland origin.

Report of a Case

This seven-year-old boy was first seen on July 9, 1957. The history revealed that about eight months prior to examination, his mother had noticed some asymmetry of his face. About June 8, the child complained of a lump in his mouth. Examination by his family physician showed a rounded tumor 2 cm. in diameter in the left cheek. The cervical nodes were normal.

The tumor was excised locally on June 12, 1957, from within the mouth. On gross examination, the specimen consisted of an irregular fleshy tumor nodule 2 x 2 x 1½ cm., and a separate fibrous capsule 3 x 2 cm., and 3 mm. thick. On microscopic examination, the tumor was composed of medium-sized epithelial cells arranged in nests and cords with scattered areas of cartilage formation typical of a mixed tumor. The fibrous membrane was dense connective tissue invaded by nests of tumor cells. The tumor nuclei were slightly larger than usual and showed moderate variation in size and a very occasional mitosis. Because of apparent inadequate removal of the tumor, the child was referred for complete excision.

Examination on July 9, 1957, revealed a 1½ x 2 cm. moderately firm, nontender movable mass medial to the left ramus of the mandible, attached to the buccal mucosa.

Surgery was performed August 9, 1957, under intratracheal anesthesia. The mass was located just posterior to the opening of the Stenson's duct. Excision was performed from within the mouth. At the completion of the dissection, the internal pterygoid and temporalis muscles were exposed as was the coronoid process of the mandible; the excision defect in the buccal mucosa was



Fig. 2. Photomicrograph taken August 9, 1957. This section illustrates a mixed tumor in which the cells are generally quite uniform in size and appearance. In places, there is a tendency to form small ducts, although for the most part the cells are arranged in clusters, nets and solid masses. Cartilage formation is evident.

3 cm. in diameter. The wound was approximately primarily with chromic catgut. The child had a normal postoperative course and was discharged on the fourth postoperative day with the recommendation of frequent follow-up visits to check the possibility of recurrent growth.

Microscopic sections of this excised specimen again revealed a mixed tumor, adequately excised. Examination in January and May 1958 revealed no evidence of local recurrence or involvement of the nodes in the neck.

Conclusion

A case report has been presented of possibly the youngest patient ever to have had a mixed tumor of *buccal* salivary gland origin.

References

1. McFarland, J.: The mysterious mixed tumors of the salivary glands. Surg., Gyn. & Obst., 76:23, 1943.
2. Howard, J. M., Rawson, A. J., Koop, C. E., Horn, R. C., and Royster, H. P.: Parotid tumors in children. Surg., Gyn. & Obst., 90:207, 1950.

Clinical Psychosomatic Conference

ULCERATIVE COLITIS

A penetrating evaluation of its psychosomatic causes

Editor: HENRY A. JOHNSEN, JR., M.D.

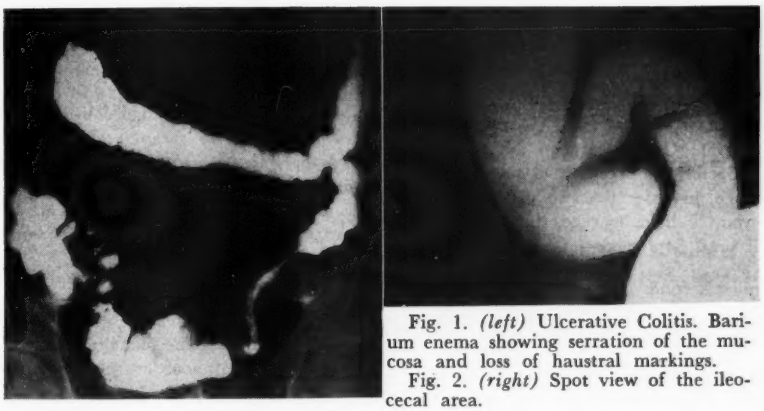


Fig. 1. *(left)* Ulcerative Colitis. Barium enema showing serration of the mucosa and loss of haustral markings.
Fig. 2. *(right)* Spot view of the ileocecal area.

Somatic Evaluation

A white man, aged twenty-seven, a married teacher trainee from south central Minnesota was admitted to the Minneapolis VA Hospital for the first time, complaining of abdominal cramps and diarrhea of twenty days' duration. Previous history revealed that he had been well, except for intermittent headaches as long as he could remember, until one month before admission. At that time he began to note daily frontal headaches of great severity together with increasing weakness, which finally caused him to stop working, ten days after the onset of symptoms. Two days later, his cramps and diarrhea began. He could not tell whether or not his diarrhea was preceded or accompanied by the passage of blood, because he was color blind. One week after the development of diarrhea, he was admitted to his local hospital with a tentative diagnosis of typhoid fever. He remained there for workup until he was tranferred directly to our hospital with the diagnosis of ulcerative colitis. He had lost 20 lbs. during his month-long illness.

Physical examination revealed a well-developed asthenic white man who looked ill. His blood pressure was 96/66 mm. Hg., pulse 100 and regular and his temperature was 100.8 degrees orally. He showed signs of dehydration and weight loss and his breath was foul smelling. There was marked abdominal tenderness in the region of the sigmoid colon. Proctoscopy revealed a thrombosed hemorrhoid and a hemorrhagic denuded area on the lowest valve of Houston. The mucosa was otherwise normal to the 16 cm. level, at which point patchy areas of friable, granular, slightly hemorrhagic mucosa became visible. Ordinary manipulation of the scope revealed that the mucosa was easily traumatized up to the 25 cm. limit and that it bled rather briskly. No polyps were seen. The physical examination was otherwise within normal limits.

Laboratory tests revealed that the hemoglobin varied between 12.0 and 13.0 gm. per cent on seven determinations during his hospitalization. The hematocrit ranged

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from 36 to 39 per cent. Similarly, his leukocyte count remained between 5,550 and 8,850 cells per cu. mm., but the differential count revealed more lymphocytes then neutrophils on four occasions. Differential leukocyte counts were otherwise normal. The erythrocyte sedimentation rate gradually fell from an admission value of 71 mm. in one hour (Westergren) to 14 mm. in one hour just before discharge. Stool examinations revealed many pus cells and much mucus but no parasites or ova were found. Fluoroscopy during a barium enema revealed rapid passage of the contrast medium through the entire colon. The terminal ileum was visualized. Tenderness was noted over multiple areas of the colon. The mucous membrane of the cecum and entire colon, except the ascending segment, was serrated, suggesting tiny mucosal ulcerations (Fig. 1). The cecum and ascending colon were contracted and narrowed (Fig. 2). The transverse colon was rigid. The normal haustral markings could not be seen in the transverse, descending and sigmoid colon. No pseudopolyps, fistulae or constricting lesions were seen. The following studies were negative or normal: urinalysis, Venereal Disease Research Laboratory (VDRL) slide test, serum agglutination tests for enteric pathogens, serum albumin, globulin and zinc sulfate turbidity, bromsulphalein (BSP) retention, three blood and stool cultures, direct and indirect Coombs tests and a roentgenogram of the chest.

DR. JOHNSEN: May we have the patient brought in for an interview now?

Interview of Patient

DR. RICHARD MAGRAW (University Consultant in Psychosomatic Medicine): Good afternoon, Mr. A. I'm Dr. Magraw. Your doctor has asked us to review your case in this conference, in order that we may continue to be of help to you. I have learned that you have been relatively well until September—

PATIENT: September second.

DR. MAGRAW: And what did you notice then?

PATIENT: At that time the first thing that happened was that I began to get headaches everyday. Aspirin would relieve it only temporarily, but I managed to keep working.

DR. MAGRAW: What was that headache like?

PATIENT: They were located towards the front of the head, perhaps.

DR. MAGRAW: Well, can you describe the headaches more accurately? There's a lot of room for a description of headaches. Did it come on at any particular time?

PATIENT: Yes. I would not awaken with it, but it would come on an hour or two after starting work. If I continued to work, it would get worse. I think if I would have stayed home in bed, it would have been better.

DR. MAGRAW: What kind of work were you doing at the time?

PATIENT: It wasn't physically hard because I was a college student working in a factory.

DR. MAGRAW: What did you think was the cause of these headaches?

PATIENT: I think I have headaches more frequently than most people, and I attributed them to eyestrain. However I never had them day after day like that before.

DR. MAGRAW: How long did they continue to bother you daily?

PATIENT: For four weeks, until I arrived at this hospital.

DR. MAGRAW: How do you happen to remember the date, September second, so well?

PATIENT: You don't forget this kind of an illness easily.

DR. MAGRAW: What day of the week was September second?

PATIENT: Tuesday.

DR. MAGRAW: And you've been sick ever since?

PATIENT: Yes, I have.

DR. MAGRAW: And what happened next?

PATIENT: On September fourteenth, the day before I was scheduled to resume school, I developed cramps and diarrhea. I went to my family physician who hospitalized me with a diagnosis of possible typhoid fever. I, myself, thought it was a bad attack of stomach flu, because of the headaches, cramps, and diarrhea, but I had never been that sick before.

DR. MAGRAW: What was so bad about this illness?

PATIENT: Well, the fact that I had to go to the bathroom every half hour or so, and kept passing either a loose stool or mucus. I continued to do this through the night. I would estimate that I had to pass a stool at least twelve times in a twenty-four hour period.

DR. MAGRAW: What was the worst part of your illness? Was it the pain?

PATIENT: Yes. The cramps would get worse just before I had a bowel movement.

DR. MAGRAW: Was there any other aspect of this illness that particularly troubled you?

PATIENT: Well, I was very weak, and I lost my appetite at the very beginning of it. I became lethargic and developed a feeling of not wanting to work at all. I lay in bed all day.

DR. MAGRAW: Tell us what happened after you entered the hospital.

PATIENT: Well, of course I didn't get much better there because they weren't treating me for ulcerative colitis. In addition, one of my relatives was not very understanding about the disease. He kept pestering me a

couple of times a day. So I think part of the trouble was psychosomatic, and I think he made the illness worse than it was. I think he made the headaches worse than they otherwise would have been.

DR. MAGRAW: What was his attitude toward your illness?

PATIENT: I think he is sort of a confused individual. I think he was acting under the impression that he was cheering me up. I feel confident that he was making me much worse because as soon as I transferred to this hospital, the headaches disappeared within a couple of days. He is one of these individuals who focuses his life around money. All he would talk about was his money problems, or how he had suffered during illnesses he had had.

DR. MAGRAW: How did that make you feel?—sad?—mad?—anxious?

PATIENT: Well, when I was in the hospital suffering from my own illness, I didn't want to hear anything about anybody else's illness.

DR. MAGRAW: So, how did you feel about this?

PATIENT: Awful.

DR. MAGRAW: Can you use another word? How about those choices I gave you?

PATIENT: Demoralized.

DR. MAGRAW: You're still evading me.

PATIENT: Well, perhaps I felt sad or melancholy.

DR. MAGRAW: Why do you think you got sick when you did?

PATIENT: My doctor says the cause of ulcerative colitis is not known. I was under the impression that all illnesses were caused by microorganisms, but I guess they are not. I suppose nerves or worry might have something to do with it. However, I was married in June of the summer previous to this one and became a father soon thereafter, and that period was, I felt, much harder on me. I felt that if this illness was due solely to nervousness, I would have contracted it then, rather than at this time. I suppose that it could have been building up for a long period of time.

DR. MAGRAW: We don't know what causes ulcerative colitis, but we think that sometimes your state of mind has something to do with it. Have you any idea about what additional factors may have brought on your illness?

PATIENTS I have thought about it and although I have not been consciously aware of increased tension, I was scheduled to begin student-teaching in my last quarter of college, the day after the diarrhea started.

DR. MAGRAW: How are you feeling now? How many stools are you passing now?

PATIENT: I feel as well as I've ever felt. I'm passing about two stools daily now. And they are all solidly formed.

DR. MAGRAW: Do you still have cramps?

PATIENT: Not for a week now.

DR. MAGRAW: When you have these things you describe as cramps, what are they like?

PATIENT: They're across the lower part of the abdomen.

DR. MAGRAW: Are they there all the time?

PATIENT: Well, they are very persistent. Two weeks ago the doctor tried to put me on solid food and I had a cramp that lasted for two and a half days after that.

DR. MAGRAW: How are your spirits now?

PATIENT: Tip-top.

DR. MAGRAW: There are many more things we could go into, but I think this will suffice. Thank you very much.

Discussion of Interview

DR. JOHNSEN: Dr. Magraw, would you comment on the interview?

DR. MAGRAW: Well, we have some kind of an idea about the kind of patient we are dealing with. He seems to be somebody who deals in abstractions. He avoids anything concrete.

In an excellent review of ulcerative colitis, one of the former medical fellows at this institution, Dr. John O'Leary,[1] who is now in practice in Brainerd, Minnesota, emphasized that you can make a history anything you want and that is one of the problems that one gets into in trying to understand what the pathogenesis of this illness is. This man is what the psychiatrists would call somewhat schizoid, because of his interest in dealing in abstractions rather than in any concrete feeling or more realistic appraisal of interpersonal relations. I think that the arithmetic of his first child and his marriage in June of last summer is probably important.

DR. JOHNSEN: Would you give us your clinical impression of the patient? What did you think of his affect? How would you size him up as a person?

DR. MAGRAW: I could sum this up by saying that he looks like a tough nut to crack, because he doesn't have much affect. You don't have much to get hold of. He's an extremely passive person, and one who would be prone to be content with, or in fact insist on, more or less magical or abstract explanations for his own behavior and symptoms.

DR. JOHNSEN: Did he strike you as being a mature person?

DR. MAGRAW: No. The word immature does not have much specificity here. Perhaps it would be better to describe him as being very passive and somewhat effeminate. Effeminate isn't quite the right word. He

might better be described as being "neuter," I guess. He's a very colorless individual. I'm not using these descriptive terms in a disparaging way.

DR. JOHNSEN: Would you describe his tone of voice?

DR. MAGRAW: He didn't flap his vocal cords the way some people do with this personality structure.

DR. JOHNSEN: Would you care to comment on the choice of adjectives he used, and those he failed to use, in describing his feelings during visiting hours, at the time of his first hospitalization?

DR. MAGRAW: He demonstrated an extremely inhibited type of defense against the expression of feeling. This is undoubtedly a fear of anything having to do with aggression or expression of antagonism. Whenever you block off a large segment of your life potential by disavowing any expression of aggression or hostility, you necessarily block off a big segment of your life with it. This man has a sort of over-all inhibition of affect, of feeling. I might guess, from what meagre impressions we can get during this brief interview, that the core of his inhibition is related to any expression of anger.

DR. JOHNSEN: I think the only word that he didn't mention, out of the choices you gave him to describe his reaction, was the word "mad." It is interesting to note that the relative he was talking about was his father who, while visiting the patient in the local hospital, described his own recent bloody prostate operation. I think if that happened to anyone of us, we wouldn't be ashamed to say we were mad.

DR. MAGRAW: Yes, this is part of what I'm talking about when I speak about his capacity to make things abstract. He'd rather talk about "the person" or "that person." Did you notice his very characteristic use of the article "the"? He spoke about "*the* cramps" and "*the* diarrhea." When a patient puts the article in front of a word, it serves a twofold function. It removes it from any blood-and-guts kind of direct level. It's like talking about "the accident" instead of "my stroke." It also has the function of sort of certifying the physical complaint as being objective. It takes the complaint out of the realm of something the patient has to document or prove. It seems to set it up on a pedestal as something that has been proved.

Psychiatric Evaluation

DR. JOHNSEN: It seems appropriate at this time to describe the developmental background of the individual we have interviewed, and to assay some of the resultant characteristics of his personality.

He was born and brought up in the same town whence he comes to us now. No unusual circumstances were associated with his birth, and he was breast-fed, like his brothers. One brother is five years older than he and the other is a year younger than the patient. Of the three, the patient was the only bed-wetter, and remained so until the age of fourteen. Because of the resultant odor, his older brother used to hit him for this. The patient says that when they were children their father used to beat this older brother, who would then take out his feelings by beating up the patient. The patient says that he had no particular talent and, as the middle child, was apparently undistinguished in the family constellation. He distinctly felt rejected by his father and remembers hearing his father express wonder and resentment about the birth of his younger brother since, for economic reasons, the father had particularly tried to avoid this contingency. Since he was born during the depths of the depression, the patient assumes that his father felt this way about him, too. The patient says that he does not bear a strong resemblance to anyone in his family, although he is probably more like his mother.

His parents are still living and are in their sixties. They were divorced three years ago, after many years of bickering, principally over money. Because of this, all of the children "had a hard time." The patient says of his father, "He's the sort of person that builds his whole world around money. Personally, as far as I'm concerned, he's mentally insane. He has an uncontrolled temper. He's extremely nervous and restless. He has a habit of swearing. He used to be doing dishes and singing, and would break out swearing and then go back to singing." He also thinks that his father is a kleptomaniac because he used to take small things from hotels where he stayed. His father is a retired paint salesman. The patient tells of a time when his father was interviewed by a psychiatrist who called him a hopeless case. He says his father hates doctors and has never paid a bill from a physician or hospital.

The patient says that his mother was submissive and "stupid for taking all that. She said a thousand times that she would leave him, but it turned into an empty phrase." He says that in 1948 his mother went back into teaching. In 1955 she divorced his father and moved out of the state because, the patient thinks, she thought his father would be worse than ever after his retirement, with not enough money and too much time on his hands.

Since retirement, his father has stayed at a hotel in town. During the month before the patient's present illness began, his mother returned and sold the family home. He describes his mother as having been very liberal, "maybe too liberal," while he was growing up, inasmuch as "she gave the children everything, to make up for not having a real Dad." However, he states unequivocally that his mother favored his younger brother. This twenty-six-year-old single brother, in the eyes of the patient and his family, was a good scholar and an outstanding student. He finished teachers' college and has been completing his army service. He plans to marry a Korean girl. His older brother distinguished himself in the family by being a good mechanic. This brother is currently being divorced from the same woman for the second time.

After graduating from high school in 1950, the patient entered service and although he admits to being "emotionally disturbed" during basic training, and to hating everything about the army, he does not give the impression that his service experiences, most of which were

in Korean combat, were any more traumatic than was to be expected.

When he was honorably discharged from military service in 1954, he entered the college where his younger brother had just graduated. He made average progress, earning B's and C's. He had only seventeen credits in student teaching to complete, and would have graduated in three months if his illness had not intervened. He said that while working at a summer factory job his headaches became more severe and recurred every day. He mentions losing "two-thirds" of his appetite. He says that as a result, he was "committed" to the local referring hospital, but it was difficult to ascertain what he meant by this. In June of the year before hospitalization, he was married to the girl he had gone with in college. His wife had just graduated from college at the time of their marriage, but could not teach because their child was born seven months later. He is excessively guilty and self-depreciatory about this and states, "It is illegal and irreligious to have premarital intercourse." He said that this baby was ill and had to have a craniotomy the following March. One wonders if he imagines that this development, plus his own illness, are forms of punishment for past misdeeds. This child is now ten months old and, just a few days ago, their second child was born. He says that his wife did not want to go through another pregnancy but "took it graciously." He seems to express genuinely warm and positive feelings toward his wife.

They have had to receive help from her parents, with whom he says he gets along well. They also receive help from the county welfare department, because of the baby's illness. This makes him feel quite ashamed, but worse than this, according to the patient, is the fact that he had to take help from his hated father during the past year.

The patient says that at one time in the past, he went to a psychiatrist who told him that he was just restless.

I would like Dr. Gilberstadt to complete the information we have on the mental function of this patient.

Psychologic Evaluation

Dr. Harold Gilberstadt (Chief of Clinical Psychology, VA Hospital): The patient was somewhat shy, passive and quiet in manner, but showed much interest in his performance on the tests and was curious about the results. His affect appeared to be moderately flattened, but not inappropriate. He responded quite volubly to questions, but lacked spontaneity and did not initiate topics. His most noticeable mannerism was a tendency to cough when sensitive areas were touched on. His speech was querelous.

On the Shipley-Hartford Intelligence Scale, the patient obtained a very superior Vocabulary score. On the Abstractions, he was just average. The best guess from this scanty intellectual testing is that the Vocabulary score represents some degree of overachievement (supported by the patient's assertion that the English language is his hobby) while the Abstractions score is an underestimate, due to his inefficiency. As a result, the estimated I.Q. of 115, in the high average range, is probably a good indication of his capacity.

In his written responses to the Biographical Data Sheet, the patient's schizoid tendencies were more clearly

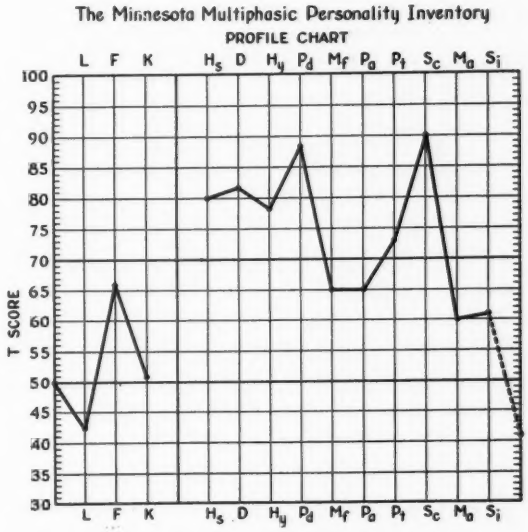


Fig. 3. The Minnesota Multiphasic Personality Inventory from a patient with ulcerative colitis. The dotted line leads to the ego strength scale, the value for which is below normal. Photography by Medical Illustrations Service, VA Hospital, Minneapolis, Minnesota.

apparent than in the face-to-face interview. His spelling was extremely poor for an individual about to graduate from a teacher's college. He mentions that he failed the third grade. His difficulties in educational achievement are probably of long standing. His peculiar stilted language is illustrated in his description of his mother's occupation as "pedagogue." In reply to a question about nervous trouble in the family, he responds, "My father is a mental aberration." When asked what his main interest is besides his work, he responds, "wife", and he says that his only hobby is "studying the English language." Marked inefficiency is evident in a tendency to drop letters from words and a failure to cross t's. In addition, he capitalizes words in a very idiosyncratic fashion. Although these are not unusual schizoid characteristics, the possibility of brain dysfunction from other functional causes should not be overlooked. The patient was reported to have been febrile at the time of testing.

The Bender-Gestalt does not show any marked impairment of ability to perceive reality, but his ability to plan and execute this simple task is inadequate, with the net result that his performance is not grossly deviant but is somewhat careless and below expectation in quality. His recall of only two figures is below average and suggests some type of memory difficulty. The over-all quality of his drawings is most suggestive of an individual who probably is experiencing some agitation and difficulty in concentrating.

The Figure Drawing is immature in general quality

and strongly shows schizoid confusion about sexual identification. He started his drawing with a woman's head and finished it with a boy's body. His comment about it was, "It started off as a woman, but I don't know if it's a woman or not."

The Rorschach shows intact ability to perceive reality and all of his responses are of good form. He does show a lack of productivity and is unable to give any responses to two of the cards. This is probably partly due to guardedness. He gives only single responses to the whole blots and is unable to selectively or systematically break down his responses into details. This is consistent with his lack of flexibility and efficiency in other intellectual performances. There is some evidence that he has an active fatasy life, but it does not appear to be bizarre. However, he does show a capacity to become overly involved, lose distance, and to become overly circumstantial on occasion. This is illustrated by his over-detailed response to the colorful Card X: "This reminds me of an artist's scratch cloth on which he gets rid of paint when he changes brushes while painting a many-colored picture. Before the change from one brush to the other, you wipe it on here blue, or red, or whatever, before you put it in the turpentine, or whatever you use to reduce out the paint you have to take off in the solution. This would account for the many shapes and colors smeared on the cloth before he put it back in the jar." This response suggests some inability to deal with the colored aspects of the card and/or the complexity of it, and shows his tendency to become idiosyncratic in the face of such difficulty. Considering the test as a whole, the fact that he was able to control his behavior and to be somewhat cautious is a favorable sign in a schizoid personality.

The Minnesota Multiphasic Personality Inventory (MMPI) profile is characteristic of an immature, highly dependent, self-depreciatory, guilt-ridden schizoid individual who does have some neurotic defenses such as somatization (Fig. 3).

DR. JOHNSEN: Thank you, Dr. Gilberstadt. If there are no questions at this time, I will ask Dr. Simon to review for us what is known about psychological factors in ulcerative colitis.

DR. WERNER SIMON (Chief of Psychiatry and Neurology, VA Hospital): Engel[2] has pooled the published reports of psychiatric data in more than 700 patients with ulcerative colitis. Detailed study of these patients reveals that major psychodynamic characteristics long antedate the appearance of the clinically-manifest disorder. The often repeated claim that the psychological findings are the result of the severe and debilitating disease finds no support when the patients are studied over a period of years, including long periods of complete remission.

Personality structure.—Many persons with ulcerative colitis are described as having obsessive-compulsive personality traits, consisting of neatness, orderliness, punctuality, conscientiousness, obstinacy or conformity. Frequently they are petulant, querulous, demanding, and provocative, but at the same time their feelings are easily hurt, their capacity to tolerate frustration is decreased, and their relationships with people are characterized by dependent attitudes. These traits are specifically associated with ulcerative colitis, although most people with such traits do not have the disease.

Relationships with people.—There is a rather consistent pattern—a dependent relationship on one or two persons and an incapacity to establish warm, genuine friendships with others. The dependency is with a parent or parent substitute, such as a physician. When these patients marry, the spouse often fulfills such a role. In this emotional symbiosis with the key figure, extreme sensitivity is displayed, and regardless of the degree of frustration, the patient finds it impossible to relinquish his own parasitic relationship. The choice of spouse is frequently determined along such lines, but also the choice of physician. It is well known that patients with ulcerative colitis either become very dependent upon their physician or establish a very superficial relationship with them. Those patients who develop such a dependent relationship, whether or not it is consciously planned by the physician, do better than patients who do not. Once a relationship has been established, it is unusual for the patient to relinquish it and remain in good health. He may leave the doctor because of negative feelings, but this is, as a rule, accompanied by a relapse, unless a substitute has been found. Any interruption of the doctor-patient contact, for example, the doctor being out of town for a few days or weeks, is likely to precipitate a relapse of symptoms. The patient may deny that the break in contact was of any importance to him, but with encouragement may be able to speak of his feelings about such separations and become more able to tolerate them. To leave a prescription or a telephone number, which the patient may never use, often serves as effective reassurance.

Mothers.—Generally the mother is described as controlling and dominating. She may make the patient feel helpless and dependent. She is often cold, strict, punitive and perfectionistic. She may sometimes assume the role of a martyr, sacrificing herself and suffering hardship, seemingly for the health and welfare of the patient.

Fathers.—Much less information is available about the fathers, who apparently play a lesser role and do not reveal any consistent pattern. Female patients often describe them as gentle, kind, and passive, while male patients refer to them as brutal, primitive, and threatening.

Sexual and marital adjustment.—In terms of overt behavior, interest and participation in sexual activity is low. Most of the women are frigid and rarely experience orgasm, while male patients have little heterosexual experience, even when married. Overt homosexuality, however, is not seen in these patients. Sometimes the wife fulfills the role of a sustaining mother,

although more often the wife takes a subordinate role to the mother and is treated more like a sibling.

Pre-morbid bowel history.—A majority of patients suffer from constipation, often dating back to childhood, prior to the development of the colitis. There is some evidence that bowel training may have been too early and punitive, and that frequent carthartics and enemas were administered by the parents.

Precipitating circumstances.—When we examine the circumstances under which the disease becomes manifest, it is often found that the time interval between a psychologically stressful situation and the onset of the first symptom of the colitis may be a matter of hours or a day or two. But there are also cases in which the onset is rather gradual and not easily correlated with a well defined stressful experience. The cases in the literature with acute onset seem to follow a pattern. Disturbing events preceding the mucosal reaction included a real or threatened interruption of a key relationship, demands for performance which the patient felt incapable of fulfilling, and an overwhelming threat from, or disapproval by, a parental figure. In cases beginning insidiously, with slight bleeding and mild diarrhea, gradually mounting pressures threatened the already precarious emotional adjustment. Some authors consider sudden loss of love, or painful humiliation, or delayed grief reaction as being precipitating life situations. These points of view are in essential agreement, but differ in emphasis.

Affect.—At the time of onset and during relapses, the feeling tone of the patient has been described as "helpless, hopeless, overwhelmed, or too much to cope with." Various authors use the terms helplessness, depression, humiliation or defeat in describing the affect.

Alternative symptoms.—Patients with ulcerative colitis may show alternative symptoms in the form of other psychosomatic disturbances. Among these are headaches, which either antedate the onset of the colitis, or occur during intervals between relapses. The occurrence of a headache during an attack of colitis often predicts the end of the attack. Observers, such as doctors and nurses, have frequently commented on the unusual aggressiveness or assertiveness of the patient during the time such headaches occur. Anorexia, nausea, and vomiting commonly accompany attacks of colitis, but some patients have the symptoms independently. The two major psychiatric complications which may be seen are psychotic depression and/or paranoid psychosis.

Fistula studies.—Grace, Wolf and Wolff[3] studied two patients with ulcerative colitis who had a colonic fistula, by simultaneous observation of changes in the bowel and the psychological state. It was concluded that life situations producing fear and dejection were associated with hypofunction of the large intestine, accompanied by pallor, lack of contractile activity and relatively low concentrations of lysozyme. Life situations provocative of conflict, with feelings of anger, resentment and hostility were associated with hyperfunction of the colon. These observations have been confirmed by other investigators.

Other psychodynamic formulations.—While psychoanalysis has yielded much valuable information about the psychodynamics of these patients, no systematic attempts to correlate the psychological and somatic processes have as yet been made, and much more careful evaluation is required before their validity can be established. Various investigators have emphasized different aspects. Alexander's formulation[4] is largely based on psychological aspects of the anal period of personality development. He postulates that colitis appears when the patient is facing a life situation which requires some outstanding accomplishment for which the patient feels unprepared and compares this with that phase of development in which the infant experiences the act of defecation as the giving up of a cherished possession on one hand and an accomplishment on the other. Szasz[5] suggests that colonic activation and inhibition, leading to diarrhea and constipation, represent the physiological sequelae of upper gastrointestinal tract activity, of which the gastrocolic reflex is the prototype. He does not believe that the bowel symptoms have any primary psychological meaning, but interprets them as manifestations of a vegetative neurosis. Sperling[6] has concentrated on the characteristics of the mother-child relationship and emphasizes the contradictory attitude of the mother who attempts to maintain her child in a life-long dependent state to satisfy her own needs, but at the same time shows unconscious rejection toward the child. Lindemann[7] has stressed the significance of the loss of a key person and the prominence of morbid grief, while Groen[8] points out a sudden loss of love which is felt as humiliation and the loss of a source of emotional support.

Why the colon is the primary site of involvement in patients with such problems has not been adequately explained.

DR. JOHNSEN: Thank you, Dr. Simon. Dr. Magraw, would you give us some of your ideas on the subject of ulcerative colitis, in general?

DR. MAGRAW: One of the lessons that ulcerative colitis has to teach us in the field of psychosomatic medicine is the recognition of the gap in our knowledge. We don't really know what causes ulcerative colitis. I think, personally, that it is a disorder in which the ultimate explanation will have to involve some recognition of the physiology of emotion. I, myself, suspect that the crucial emotion is grief, or the separation reaction. We have a problem of relating the emotion on the one hand, to the pathologic "endpoint" on the other. Many psychiatrists have, for years, turned their attention in this disorder to the symbolism of defecation, of riddance of noxious material. This is a characteristic approach, I might say. Psychiatrists, in general, in approaching psychosomatic difficulties, emphasize symbolism. The organically-minded physician tends to emphasize the more mechanistic aspects. Actually, I think both groups may have missed the point in their emphasis on the diarrhea. I am in complete agreement

with Engel when he points out that if we are going to understand this disease, we have to explain the whole story of it. Bleeding is the first symptom in the majority of cases. Diarrhea is by no means invariably present early in the disease. We don't have any pathognomonic way of identifying this disease. The differential diagnosis between this and other types of bloody diarrhea with friable mucosa still remains a problem. I personally think that the lesion which gives rise to the ulcerations develops in the intima of the terminal blood vessels of the wall of the colon. I suspect that we may find that there is something in the physiology of grief, or possibly anxiety, or maybe even rage that produces this effect.

Discussion

DR. JOHNSEN: Are there any questions?

DR. G. BEAUMONT (Fellow in Internal Medicine): How has the patient fared since his admission to this hospital?

DR. JOHNSEN: He has been afebrile for the last six days and is now having no more than two, non-bloody, well-formed stools a day.

DR. BEAUMONT: Do you think he has improved because of your support and reassurance or because of the rest and medications that he has received?

DR. JOHNSEN: Well, I think his improvement can be attributed to both factors. Certainly his colon is physically ill and has made his body ill. Rest and medications are important. He has been managed on a combination of sulfonamides, antispasmodics, vitamins, phenothiazines, barbiturates and constipating agents, together with a low residue diet. From the emotional point of view, he has temporarily escaped from the trap that he was in on his home grounds—that is, the threat of completing education and being expected to thereafter sever whatever immature bonds of family life he may have retained and go out into the world and function as an adult.

DR. W. GRIMM (Fellow in Internal Medicine): Are you implying that psychiatric care is necessary or even indicated for all such patients with this disorder?

DR. JOHNSEN: No, a psychiatrist is usually not necessary and may not be available. It should be noted, however, that there are a few cases on record in which it is felt that a permanent cure of ulcerative colitis has been obtained by means of long-term uncovering psychoanalysis. However, that is neither practical nor possible for most patients with this disorder. The community physician most often serves, sometimes unwittingly, as an adequate therapist for the emotional aspects of the disease.

DR. M. GOEPFERT (Staff Physician, Medical Services): I would like to ask Dr. Magraw if he has had any experience with shock therapy in patients with ulcerative colitis and involutional melancholia.

DR. MAGRAW: I can think of two such patients who did very well after electroconvulsive therapy.

DR. JOHNSEN: Are there other questions or comments? If not, I would like to ask Dr. Gilberstadt to sum up the case presented today, in the light of what we have just heard about ulcerative colitis.

Summary

DR. GILBERSTADT: The patient is a psychologically crippled, peculiar, rigid, immature, dependent, self-depreciatory and guilt-ridden individual, who is unable to cope successfully with the problems of his life. However, his problems have been difficult ones. From the time of his return from service he has been subjected to a series of stresses. These include his parents' divorce, his marriage after conception of their first child, the subsequent brain surgery on this child, the sale of the family home by the mother, the birth of the second child, the unhappy relationship with his father and, lastly, the imminence of finishing college and having to play a role in the world. He is attempting to imitate his mother and brother in his choice of teaching as an occupation. He himself has said that even the prospect of practice teaching was highly unnerving to him. Even more threatening was the eventual prospect of having to go out on his own to assume independence as a teacher. It was at this time that he developed colitis.

On the other hand, he has intact ability to perceive reality and appears to have a healthly fantasy life. He has considerable insight and, although not a good prospect for intensive psychotherapy or any basic personality change, the patient has sufficient strengths so that, with continued support from his wife and other sources, such as a physician, he should be able to make at least a marginally good adjustment.

References

1. O'Leary, J. B.: Chronic ulcerative colitis. Grand Rounds, Medical Services, Minneapolis VA Hospital, 13:1, 1954.
2. Engel, G. L.: Studies of ulcerative colitis: III. The Nature of the psychological processes: A review and formulation. Am. J. Med., 19:231, 1955.
3. Grace, W. J., Wolf, S. and Wolff, H.: The Human Colon. New York: Paul B. Hoebner, 1951.
4. Alexander, F.: Psychosomatic Medicine. New York: W. W. Norton & Co., 1950.
5. Szasz, T.: Oral mechanisms in constipation and diarrhea. Internat. J. Psycho-Analysis, 32:196, 1951.
6. Sperling, M.: Psychoanalytic study of ulcerative colitis in children. Psychoanalyt. Quart., 15:302, 1946.
7. Lindemann, E.: Modifications in the course of ulcerative colitis in relationship to changes in life situations and reaction patterns, life stress and bodily disease. A. Res. Nerv. & Ment. Dis., Proc., 29:706, 1950.
8. Groess, J.: Emotional factors in the etiology of internal disease. J. Mt. Sinai Hosp., New York, 18:71, 1951.

Editorials

JOHN F. BRIGGS, M.D.
ARTHUR H. WELLS, M.D.
HENRY G. MOEHRING, M.D.

GOUT

It has often been said that one need only think of gout to make the diagnosis. This statement is based on the solid clinical fact that in the great majority of cases the picture presented by the disease is characteristic. Because of this characteristic picture, gout is an ancient disease having been described very early in medical records.

As often happens, however, advances in medical science confuse as well as clarify and one of those areas of confusion has been described in a recent article.* The investigations presented led to the emphasis of two basic observations. Firstly, hyperuricemia is a trait widely distributed in the general population. When it occurs in association with joint disease differential diagnosis may be difficult since in the minds of most physicians hyperuricemia plus joint disease equals gout. The authors point out that such may not be the case and emphasize that the physician faced by this diagnostic problem will do well to recall the random occurrence of elevated serum uric acid values. He need feel no embarrassment over making the diagnoses of rheumatoid arthritis, degenerative joint disease, et cetera *and* hyperuricemia.

On the other hand, it was pointed out that in about one-fifth of gout cases the pattern of the disease is not the typical one described in the literature. It was the opinion of the authors that a detailed review of the diagnostic criteria for gout should be pursued in every case of obscure joint disease. In particular, the history should be studied for evidence of periodicity of symptoms especially in the early phases of the disease and for relationship of symptoms to operative procedures, trauma, strenuous exercise, the discontinuance of steroid therapy, or the administration of liver, mercury, or ergot. One should inquire regarding a family history of gout and search carefully for tophi in the subcutaneous tissues, in tendons, and in bone. Hyperuricemia is usual at some time during the course of gout, but one should not discard this diagnosis completely in the face of a normal value since often uricosuric medication, specifically Aspirin, will have been taken and in occasional patients this sign does not appear until late. The renal status should be studied. The history of the passage of a urate stone makes the diagnosis probable, and chronic renal disease is suggestive evidence. Finally, a prompt (twenty-four hours) response of joint symptoms to an adequate course of colchicine given early in an attack is an excellent sign favoring gout. Lack of response of chronic joint symptoms does not constitute evidence against gout.

The authors recognized the fact that in certain cases the diagnosis can only be established by continued observation of the patient, often over a period of years, however, they believe that, when gout is suspected, the differential points should be checked off in systematic fashion since, with the present availability of potent uricosuric agents, the course of the disease may be appreciably modified.

J.C.G.

*Goldthwait, J. C., Butler, C. F., and Stillman, J. S.: The diagnosis of gout. Significance of an elevated serum uric acid value. New England Journal of Medicine, 259:1095-1099, 1958.

THE NEW MEDICAL SCHOOL IN SAINT PAUL

There has been ample documentation of the impending and significant shortage of doctors foreseen in this country in the next ten years. The Association of American Medical Colleges, the United States Department of Health, Education and Welfare, and the American Medical Association have all expressed their concern in this matter. The public has been alerted to this need repeatedly by numerous articles in magazines and other periodicals in the past year.

Something can and will be done about the situation. It is basically a public responsibility, and the public through its governmental agencies will rise to the occasion and endeavor to correct it. Is it not reasonable, then, that the medical profession as a whole provide the guidance and initiative in the answer to this problem before actual governmental action takes place?

As the need becomes more crucial, the federal government will no doubt create the needed

First of a series of three editorials on the proposed new medical school.

schools. We shall surely be paying for these schools through increased taxes and without significant control by the physicians who believe in the philosophy of free enterprise in medicine.

It is apparent that to provide more doctors, we must expand the medical teaching capacity both by enlarging the present schools of medicine and by creating new ones. Our present medical schools, including our own State University, are making heroic efforts to meet the need by increasing their student enrollment. But it is unreasonable to suppose that this enlargement of classes could go on much further without the possibility of jeopardizing the quality of training.

Another factor in this increase in capacity of medical education, which is worthy of some consideration, is the increasing numbers of the government (usually state) financed and controlled medical schools. In a country with the philosophy we have of preserving private enterprise, it appears that an equal or near to equal balance should be maintained between government institutions and private ones. There are few more powerful stimuli to the maintenance of quality than good competition.

The metropolitan area of Minneapolis and Saint Paul represents the only population center between Chicago and Seattle with enough clinical material to support another school. The states of North Dakota, South Dakota, and Montana have a present physician shortage which a private medical school nearby might ease a great deal. Both North Dakota and South Dakota have two-year medical schools. These states would welcome a private medical college nearer home for their third-year and fourth-year students to attend.

Minnesota is one of the leaders in higher education in the United States. Its literacy rate is one of the highest, if not the highest, in the country. The University of Minnesota, the Mayo Clinic and the numerous clinics in the state are evidences that in medical education this state is outstanding. What better setting could there be for the development of an outstanding private medical school?

Such a medical school, according to the latest rules of the Association of American Medical Colleges, would necessarily be connected with an existing college or university and give basic science as well as clinical training. In Saint Paul, there are several fine colleges giving an excellent environment for a new medical school. One of these colleges, in particular, is interested in having such a school in its academic structure.

At the present time, there is a more than ordinary possibility that the city of Saint Paul and Ramsey County will build a new city and county hospital. This, combined with the present Wilder Dispensary and the medical complex of several surrounding large private hospitals, would make an ideal home base for a private medical school. There are other large private medical complexes now under consideration in Minneapolis which could benefit immensely from academic association with such a school.

Such an undertaking, as everyone realizes, is a very costly one. For a medium-sized school having around seventy students in a class, the non-instructional cost would be about $350,000 a year and a minimum instructional cost of around $1,000,000 a year. This means an endowment of from $25,000,000 to $30,000,000 to provide this minimum of annual operating expense.

Preliminary studies show that there is more than enough private wealth in this area from which to raise such an endowment. It remains for those who have control of this potential endowment to be persuaded to underwrite this project. The need is a serious one, and this proposal of a new private medical school already appears to be an appealing one to most responsible citizens who have been appraised of the facts. Physicians have a duty to society to give their support to such enterprises as this.

N.A.M.E., Incorporated

ADRENOCORTICAL STEROIDS

There can be little doubt that the newer corticoids have increased antiinflammatory activity, but this increased potency becomes significant only when assessed against the incidence of known side effects. While the term "side effect" is used freely in association with corticosteroid therapy, it is understood that in most cases they are really physiological effects which because they are excessive become undesirable.

The side effects of corticoid therapy are well known and perhaps we should review them in order.

Edema or Fluid Retention—Cortisone and hydrocortisone are well known for their ability to lead to fluid retention and edema. While this is

valuable in the Addisonian patient, it represents a definite drawback to the therapy of other conditions. The predni-steroids eliminated this complication to a very considerable extent, and it is encouraging to note that the new corticoids also lack sodium-retaining propensity.

Gastric Intolerance—This was not a major problem of corticoid therapy until the introduction of prednisone and prednisolone but was frequently observed during continued administration of these very active compounds. Dyspepsia, indigestion, heartburn and epigastric distress have all been reported following the use of the predni-steroids. At present, there is evidence that these digestive disturbances are definitely reduced by the newer corticoids.

Peptic Ulcer—This has always been one of the major hazards of corticoid therapy not so much because of the frequency with which they occurred, but mainly because the symptoms of impending perforation or hemorrhage were completely masked and the patient was often in extremis before a diagnosis of this complication could be made. There is little doubt that ulcer formation occurs more commonly during prolonged therapy with a corticosteroid, and therefore, the newer corticoids have not yet been fully valuated in this respect. There is now some evidence to indicate that the concurrent administration of an anticholinergic agent during steroid therapy may be beneficial in cases where an ulcer is suspected. The virtue of upper G. I. tract x-ray examination during long term therapy with corticoids should also be given earnest consideration.

Mental Side Effects—Emotional disorders of a severe nature have been one of the more serious hazards of coricoid therapy. The euphoria noted may not be too objectionable in chronic illness, but with certain of the older compounds such as cortisone, mental changes were not limited to this relatively harmless effect. Depression, disorientation, frank psychosis and suicidal tendencies have been reported. The evidence at present is that the newer compounds offer a lowered incidence of these mental side effects, and to date no mental changes of a severe nature have been noted with either methylprednisolone or triamcinolone.

Moon Facies.—This is probably the most conspicuous of the Cushingoid symptoms seen during therapy with the earlier corticoids and it is also one of the most persistent side effects. As a rule it appears after prolonged low dosage therapy, but earlier in the high dosage therapy required for such conditions as systemic lupus erythematosus. Its incidence with methylprednisolone is low. There have been reports that with triamcinolone, in certain cases previously treated with other corticoids, this side effect may actually be reversed and the moon facies disappear.

Anorexia and Weight Loss.—These have been observed with one of the newer corticoids. In contradistinction, the older steroids often caused excessive appetite and weight gain which also was undesirable. There is at present no known explanation for this effect and further study is required. These unusual side effects have not been observed following the use of methylprednisolone.

Supraclavicular Fat Pads.—This side effect has been reported with methylprednisolone but to date has not been mentioned in the literature on triamcinolone.

Acne and Hypertrichosis.—These may both be regarded as essentially of a minor nature, but are somewhat unpleasant to the average patient. The newer corticoids appear to offer a relative freedom from these, although, one worker in the field did note an increased incidence of these minor side effects with triamcinolone.

Ecchymosis or Easy Bruising.—This side effect was comparatively rare with the older steroids but became much more prominent with the introduction of prednisone and prednisolone. There is some evidence at present that the newer corticoids may reduce the incidence of this side effect, but as yet a full evaluation must await the passage of time.

Diabetic Syndrome.—The diabetogenic activities of the corticosteroids are well known, and this phenomenon has been noted following the use of methylprednisolone. To date, no reports have appeared in this respect concerning triamcinolone.

Osteoporosis and Pathological Fractures.—It is impossible at this time for the incidence of these conditions to be fully evaluated with the newer corticoids, since they primarily result from long-term therapy.

Summary.—These four editorials have attempted to cover in some degree the pharmacology, the clinical potentialities, and the side effects of the newer corticoids. There can be little doubt that these compounds represent a major advance in therapy, and will make this form of treatment more acceptable to patient and physician alike.

JOHN J. PEPPER, M.D.

OXYGEN THERAPY AND ALLIED PHYSIOLOGICALLY BASED PROCEDURES IN PULMONARY EMPHYSEMA

The therapeutic use of oxygen generally results in more conspicuous clinical improvement in patients with pulmonary emphysema than in any other chronic illness. Relief of dyspnea, which is characteristic, is invariably paralleled by an elevation of the arterial blood oxygen saturation. The more severe the hypoxia, the smaller is the concentration of oxygen required to produce a significant increase in tissue oxygen tension, because of the steep slope of the O_2 dissociation curve between 60 and 80 per cent arterial oxygen saturation.

In addition to the symptomatic benefit produced by the consistent lowering of the burdensome ventilation, as well as the work of breathing, oxygen inhalation has often aided the restoration of cardiac compensation when routine measures were ineffective; in fact, it is among the chief effective agents for the management of both respiratory, as well as cardiac insufficiency.

However, so many warnings have appeared concerning "oxygen poisoning" and specifically against the use of oxygen in chronic pulmonary emphysema that patients have at times endured a dangerous degree of hypoxia which not only wrecks the machinery, as Haldane long ago said, but denies the therapeutic benefit that is so near at hand and so practical of administration. Abrupt administration of 40 to 100 per cent oxygen to cases of diffuse obstructive bullous pulmonary emphysema constitutes overdosage of oxygen which in this clinical entity is then followed by respiratory depression, and a clinical train of symptoms due to acid shift in pH and uncompensated respiratory acidosis. The hazards of this kind of oxygen therapy have too often been proclaimed without at the same time describing the proper method of administration. Intermittent positive pressure breathing (I.P.P.B.) treatments, even for ten minutes is often advocated with the inhalation of air, rather than 30 or 40 per cent oxygen. The advocates of intermittent pressure breathing devices for hyperventilation convey the impression that hyperventilation with these machines is apparently powerless against the lowering of the ventilation provided by an oxygen-enriched atmosphere.

It would seem that effective enhancement of the ventilation is not readily provided by the routine employment of most I.P.P.B. apparatus. Mechanically induced augmentation of breathing requires expert and almost continuous supervision. (From the viewpoint of therapeutic benefit, administration of caffeine is frequently overlooked as an effective respiratory stimulant. The patient with bullous emphysema in respiratory distress is not treated with oxygen concentrations over 30 per cent by mask, tent, or catheter, until three or four days previous acclimatization to lower oxygen percentages. One or two liters per minute by double bent tube is sufficient to increase the arterial pO_2 considerably in the presence of severe hypoxia, without respiratory depression, provided sedation is given under skillful management to avoid exaggerating the narcotic tendencies of acid shift in pH.

Concerning the possible toxic effects of oxygen, Lambertson has the following to say:

> "Clinically, the development of pulmonary oxygen toxicity is rarely encountered even when oxygen administration is continued over many days . . . no toxic manifestations have been observed with inspired oxygen concentrations below 60 per cent, and higher percentages are difficult to obtain with several commonly used techniques of oxygen therapy. A second factor detracting from the clinical importance of pulmonary irritation by oxygen is that its onset is delayed even by normal interruptions of therapy such as the routine care and feeding of the patient. Possibly for this reason, patients with cardiac decompensation, treated for several days with 100 per cent oxygen show no signs of pulmonary irritation.
>
> "It therefore appears that pulmonary oxygen toxicity is an unlikely complication of oxygen therapy in adults and is not a factor to be considered when deciding whether to begin treatment with oxygen."

The crucial advantages of a regimen of progressive increase in the oxygen concentration delivered to the patient has often been outlined and the physiological events initiated by oxygen therapy have been recently reviewed in detail. An evaluation of the mechanism of dyspnea in our clinic has indicated that the patient with emphysema does not respond to increased pCO_2 tensions when offered measures which increase gas diffusion in the lungs and decrease pulmonary effort.

The lowering of the pulmonary ventilation which is achieved by controlled oxygen administration results in a high pCO_2 in the arterial blood and alveolar air. The accompanying increase in CO_2 elimination per breath (or per liter of ventilation) permits the relief of dyspnea initially achieved by oxygen inhalation to continue without acid shift in pH; in addition, the compensatory stimulus to the outpouring of chlorides constitutes a significant advantage in patients with cardiac insufficiency, facilitating the characteristic diuresis. Of special interest in the fact that the work of breathing, as measured by the oxygen consumption, is strikingly diminished as dyspnea is relieved, and, consequently, the production of CO_2 is lessened correspondingly. Furthermore, during walking exercises, administration of oxygen in concentrations of 28 to 50 per cent can be inhaled *without previous acclimatization,* with the development of cardiorespiratory reserve as a direct consequence of physical exertion. *No undue depression of respiration* has been observed during the past ten years in severe cases of bullous emphysema when the patient is walking. Ultimately, the capacity to walk breathing air is achieved by preventing the development of severe hypoxia and an unduly increased ventilation.

Instead of the so-called vicious cycle of CO_2 retention due to inhalation of oxygen, the response is indeed benignly opposite! The cycle is advantageous provided controlled oxygen therapy is utilized. The attempt to lower by mechanical means the elevated CO_2 levels in the compensated emphysematous patient (i.e., the patient with normal pH and CO_2) is generally futile, since the effect on the blood carbon dioxide is slight and transient. If indeed the pCO_2 and bicarbonate were significantly depressed by deliberate hyperventilation, increased respiratory efforts by the patient to eliminate CO_2, at a lower alveolar CO_2 would follow, since no improvement in diffusion would be accomplished. With an increased ventilation, an increased CO_2 production would ensue; more energy is required for breathing than a comparably elevated ventilation would produce in normal subjects.

The priority of the factors which lower the effort (and work) of breathing over the respiratory center's response to CO_2 has been observed in a variety of therapeutic measures applied to patients with diffuse obstructive pulmonary emphysema:

1. Diaphragmatic breathing, instituted instead of upper costal respiration, and accomplished by
   (a) The head-down position.
   (b) A 20 to 30 pound buck-shot bag on abdomen.
   (c) An emphysema belt.
2. Inhalation of bronchodilator and bronchovasoconstrictor aerosols.
3. Increase in reserve volume tidal air.

These procedures which increase the efficiency of breathing are generally characteristically followed by a lowered minute volume of respiration; the corresponding relief of dyspnea is not accomplished at the expense of physiological impairment. In several investigations in which the effects of the above described procedures had been studied, the pCO_2 is not altered. The patient, unless afflicted by psychoneurosis, does not choose to hyperventilate if offered an opportunity to decrease respiratory effort, provided this opportunity is based on therapeutic procedures which enhance alveolar diffusion of O_2 and CO_2. Another illustration of the value of oxygen therapy will be presented.

Enchancement of the general activities, physical and mental, of the patient with pulmonary emphysema, the aim of rehabilitation therapy, is now provided in more practical ways by various recently employed apparatus to administer oxygen. A lightweight cylinder containing 180 liters of oxygen makes it possible for the patient to walk thirty to forty minutes, at an oxygen flow of 6 to 4 liters per minute with approximately 3 pounds over his shoulder; in addition, a pocket oxygen device (called Oxy-Hale) has been equipped with a venturi by which oxygen administration may be carried out for two minutes, or, with three connected cylinders, for three to six minutes, depending on the concentration selected.* A metal sleeve, which fits over the venturi, may be adjusted to provide 28, 32, 40, or 50 per cent oxygen. The acute dyspnea which so many of these patients suffer on exertion may be treated in this way, and, thereby, free the patient for excursions to friends and places of entertainment which otherwise an apprehension of dyspnea might forbid.

Oxygen treatment has had its ups and downs! It is regrettable that in recent years so much has been done to frighten the practitioner against the proper employment of a remedy of such crucial value to the patient with pulmonary emphysema. Priestly said of his discovery: "Who can tell but

*Controlled Pressure, Inc., Box 1933, Erie, Pennsylvania.

that in time this gas will become a fashionable article in luxury. Hitherto, only two mice and myself have had the privilege of breathing it." The fashion of oxygen therapy appears to be on its way again.

ALVAN L. BARACH, M.D.

SINGLE CHARITY FUND DRIVE

A single annual charity fund in a community is favored by many physicians. The continuous procession of appeals for funds by friends, patients and thru the mail would cease at least for a while. Only one soul searching expedition would be necessary. Many fewer man hours would be expended collecting funds. The joint United Fund or United Community Fund organization could take over our charity problems. Everyone would be happier —or would they?

Physicians are keenly interested in the "Third Party" and its complications. They certainly know that in certain situations the "Third Party" does not represent medicine at its best. Voluntary health agencies are as individualistic as people. They have been struggling for their very existence with a "Third Party," the United Fund. The American Cancer Society, American Heart Association and many other excellent organizations could be rendered impotent and sterile by a loss of a personal control of their personal drive for funds.

In its usual thorough and democratic procedure, the House of Delegates of the American Medical Association at the last San Francisco meeting resolved:

"That the House of Delegates reiterates its commendation and approval of the principal Voluntary Health Agencies." "That it is the firm belief of the American Medical Association that these agencies should be free to conduct their own campaigns of fund raising and public education and to direct programs of research in their particular spheres of interest."

Even if municipal laws enforcing single or United Fund drives were constitutional, which they are not (see Supreme Court ruling on Dayton, Ohio vs. American Cancer Society Inc.), one should carefully examine the effect of such laws on the voluntary health agencies. These are important institutions in our way of life.

THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

UNLICENSED CHIROPRACTOR SENTENCED AT CHASKA FOR UNLAWFUL SALE OF DRUGS

On November 17, 1958, Ernest Bartels, thirty-two years of age, Hamburg, Minnesota, was sentenced at Chaska, Minnesota, by the Hon. Harold E. Flynn, Judge of the District Court, to pay a fine of $100.00 or serve thirty days in the Carver County jail for selling drugs while not being licensed as a pharmacist. Judge Flynn then suspended the sentence and placed the defendant on probation to the Court for one year. The defendant had been charged previously in a complaint signed by a representative of the Minnesota State Board of Medical Examiners with maintaining an office for the practice of healing without having a certificate of registration in the basic sciences. However, due to special circumstances which arose after the issuance of the complaint, a motion was made to the Court by the Carver County attorney to reduce the charge to that of unlawfully selling drugs. Judge Flynn granted the motion and then immediately sentenced the defendant as stated above.

When Bartels was questioned by Judge Flynn prior to being sentenced, he stated that he graduated from high school in Belle Plaine, Minnesota, in 1944, after which he served in the armed forces. Upon his discharge from the army, Bartels said, he attended a railroad telegraph school in Minneapolis and then went to San Antonio, Texas, where he attended the Texas Chiropractic College for four years until 1953. According to the defendant, he began the practice of chiropractic in St. Joseph, Missouri, in 1954 but practiced for only four months. Bartels had been arrested after an investigation disclosed that he had sold three bottles of "Abundavita" tablets to a Cologne, Minnesota, man for $24.00. The defendant admitted to the Court that he had sold the tablets but called them a "food supplement." Bartels has no license to practice any form of healing in the State of Minnesota.

TWO FELLOWSHIPS OFFERED IN AUDIOLOGY AND SPEECH

Opening of competition March 6 for two fellowships in audiology and speech at Northwestern University has been announced by the American Hearing Society, its member agency, the Saint Paul Hearing Society, and the University. Winners of the awards, known as the Reine Humbird Myers Fellowships, will receive $3,000 a year for two years while participating in a graduate program in preparation for work in local hearing societies.

The fellowships were established in 1957 through a bequest from the Myers Foundation of Saint Paul, Minnesota.

Further information and applications may be obtained from Crayton Walker, executive director, American Hearing Society, 919 18th St., N.W., Washington 6, D. C. Closing date for returning completed applications to Mr. Walker is April 6.

President's Letter

THE DOCTOR'S BILL

In this age of rising costs of practically everything, the medical profession, of course, seems to be a favorite target for magazines, newspapers, and politicians to take a shot at. They all seem to forget, however, that our overhead has increased a great deal also in such items as increased rent, higher wages, cost of equipment, and supplies.

In a recent letter from Governor Orville Freeman, he says that the state has experienced an increased expenditure for medical services of 1.5 to 2 million dollars per year during the last period.

However, the Governor did not give the breakdown in the items that are included in this so-called tremendous figure. Actually, during the past several years in Minnesota, medical fees account for only about 10 per cent. whereas hospitals, nursing homes and domiciliary care account for more than 75 per cent and drugs about 9 per cent.

Even with our practice in general, more physician-patient relationships have been strained by a misunderstanding about fees than perhaps any other disagreement. The first safeguard against this misunderstanding is an explanation of fees being charged.

Some doctors believe they lack time for a frank discussion of these matters with patients, but lack of time is not a valid excuse. A patient has every right to know why he needs treatment or surgery, what it will consist of, and what it will cost—particularly where major services are to be rendered.

For minor services, a charge slip often can give the necessary information to the patient. But even if a charge slip is used, the end of the month statement should be itemized. Too often patients forget how much service was rendered during the month. Thus a brief statement reading, "For professional services—$75," may seem to the patient to be "too high." An itemized breakdown usually will avoid this common misunderstanding.

It should also be known that generally the patient's reaction to a fee is determined more by the doctor-patient relationship than by the size of the fee itself, or by the quality of medical care given.

Dr. Harry Ungerleider, director of medical research for the Equitable Life Assurance Society, recently stated that medical fees account for only about 10 per cent of all illness costs. Drugs take 11 per cent and hospital costs most of the rest. The doctor usually orders these other things, so people often tend to blame him for all the high costs of care.

We must look to our laurels and improve our physician-patient relationships. This poses a special challenge of self-discipline to the medical profession. Also, doctors may find themselves under occasional pressure from a patient to collaborate in abuse of insurance protection. The best answer to this problem is probably a continuing awareness by the medical profession of the importance of professional integrity.

Benjamin B. Foulston MD

President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

HEALTH FIELD LURES LABOR UNIONS

The following article by W. F. Francka, M.D., president of the Missouri State Medical Association, has been reproduced in a number of the state medical journals throughout the United States. Because of its significant general implications, the article is also reproduced in this publication for your attention and consideration.

The third-party element continues to grow in influence in the practice of medicine as labor expands its welfare programs in the health institute field.

One of the latest to enter the field is the St. Louis meatcutters' union with a "one-stop" medical center as it was described by reporter Ted Schafers of the *St. Louis Globe-Democrat.* The new structure in St. Louis, built at a cost of one million dollars, is expected to have an annual operating budget of $300,000.

Funds to provide care for some 2,200 meatcutters and their families come through fringe benefits negotiated by the union. As Schafers said:

> "Such protection does not come cheap. It only seems so to the workers because employers in most instances are paying bills through union-negotiated health and welfare contracts."

Benefits Go Both Ways.—Preventive medicine and how it will cut down on absenteeism is stressed by the union as one of the benefits of the new clinic. Actually, the program also gives the union an even stronger hold over the union member because it takes over another area of his personal life, his health.

"We are going to make it part of our contract that every meatcutter must take a complete physical checkup at least once a year," the union president said. "We are going to concentrate first on the medical phrases; the dental work will come later."

It, of course, is impossible to argue with the wisdom of a physical examination each year. But for a union official to talk of imposing it on his constituents is another thing.

Automatically, the free choice of whether a butcher wants an annual physical examination or not is destroyed, not to mention quite a bit of the element of free choice of physician, if the butcher wishes to go outside the panel of physicians offered to him by the clinic.

And why would the meatcutter be told to get a physical examination each year?

Deeper Than Mere Health.—Ostensibly, because it is good for his health. But looking at it from another side, this just helps round out the power of the union president. It gives the union yet another control over its constitutents.

It also gives the union more bargaining power with the employers who are forced to pick up the check for the health clinic. To the meatcutter's boss and the consuming public, the union chieftain can point out how the public is protected by having healthier meatcutters.

But what of the individual butcher? He has just signed away another freedom in return for what he feels is economic betterment. By the time he adds up his dependence on the union, he virtually is living in a segregated socialistic society run by the union leaders. Once a complete retirement plan is worked out for him, he will have few decisions to make.

The growth of labor health centers is part of a pattern across the nation. The field of fringe benefits offers a wealth of rich-sounding phrases and services that help weld union cohesion. Health and welfare benefits normally are administered by the union officials, and if a worker does not choose to avail himself of them, it is only the worker's loss.

Hard Not To Go Along.—However, the worker usually sees that health benefits actually are part of his salary and he can ill afford to continue going to his old family doctor. It has a special appeal to the worker with a large family. Mother can take all the kids down to the union clinic for a checkup without paying out a dime. This doubly appeals to her if the doctor there treats her nice and appears to be competent.

The success and future of the labor health institutes depend upon these factors. If they satisfy

the workers and their families, they doubtless will continue to grow.

Two other labor groups in the St. Louis area already have indicated a keen interest in such programs, according to the *Globe-Democrat*. They are the carpenters' organization with 10,000 members and the machinists with 15,000.

To give some indication of the scope of the health and welfare field, it has been estimated by the Department of Labor that about 8 billion dollars is invested annually in such programs.

UMWA a Third-party Giant.—One of the early leaders in the field was the United Mine Workers Union. In the fiscal year ending June 30, the UMWA is reported to have spent more than 58 million dollars for hospital and medical care.

There was a major controversy in the last AMA House of Delegates over the relations between medicine and the UMWA Welfare and Retirement Fund. As it came out, the House called for an immediate public relations campaign to educate the public to the restrictions to free choice of physician and hospital being imposed by the UMWA.

Yet another giant in the labor field is even now examining the health field. The United Steelworkers Union has called for a broad study with the view to setting up union-operated hospitals and clinics in areas which it feels may need them.

"We are confident that a united and determined membership can win the goal of full medical security for all steelworkers through the process of collective bargaining," union spokesmen declared.

This trend toward more and more union-negotiated health and welfare institutes is surprising in view of the increasing availability of voluntary and commercial insurance plans which allow free choice of physician and facilities. It is difficult to understand why the unions do not use these funds to purchase voluntary health insurance plans. Through such a method free choice of physician automatically is available to the workers. This would eliminate at least one of the objections of the medical profession to such programs. In view of recent congressional investigations into the management of union welfare funds, insurance programs would seem to provide the stable protection that the workers have a right to expect at a price commensurate with the benefits of the insurance policy.

CENSUS BUREAU REPORTS HIGH BIRTH RATE—INCREASED DEATHS

Births in the United States continued at a high level for the fiscal year ending June 30, but there was a slight slowing down of population growth, apparently because of the increase in the number of deaths, according to the Bureau of Census population estimates.

Births for the fiscal year 1958 totaled 4,300,000, or 24.8 births per 1,000 of the population. However, the Bureau predicted, births in the second half of 1958 will be "appreciably lower" because of the recent decline in marriage rates.

The slight slowing down of population growth in the year ending June 30 was apparently due more to the increase in the number of deaths during 1957-58 than to any change in the number of births.

For the 12-month period ending July 1, 1958, deaths in the United States numbered 1,679,000 as against 1,579,000 deaths in the previous year. The death rate reached its highest level in recent years in 1957-58, with 9.7 deaths per 1,000 population. The Bureau noted that most of the excess of deaths in 1958 over 1957 was concentrated in the late fall and early winter of 1957-58, when the influenza epidemic occurred.

CONGRESS HAS FOUR PHYSICIAN MEMBERS

Minnesota's Doctor Walter Judd is one of the four physician members of the 86th Congress. This is one less than the 85th Congress. Returned in addition to Doctor Judd were Doctors Thomas Morgan and Ivor Fenton, both of Pennsylvania. The new addition is Doctor Thomas Dale Alford, a board ophthalmologist of Little Rock, Arkansas, where he has been in active practice since 1948. Doctor Alford, 42, was educated in Arkansas schools and received his medical degree from the University of Arkansas. He served in the Army Medical Corps during World War II.

Doctor Morgan, who has been acting chairman of the House Foreign Affairs Committee since last summer, is slated to become chairman when the new Congress is formally organized. He will thus be the first physician chairman in the 136 years of the committee.

Defeated in recent elections were Doctors Will Neal of Virginia, and A. L. Miller of Nebraska.

WHO NEEDS A FORAND BILL?

In 1951, among a total Blue Shield enrollment of twenty-one million persons, nearly a million, or a little less than five per cent, were over sixty-five years of age. Six years later, in 1957, among the total of *forty million* persons enrolled, two and one-half million, or six and one-half per cent, were over age sixty-five. Thus, in these six years, the number of Blue Shield members over sixty-five increased 170%, while total Blue Shield enrollment increased only about eighty-five per cent.

Attention was called also to the fact that of the total number of people past sixty-five who have medical-surgical insurance coverage, about two-thirds are covered by Blue Shield.

Of all the people in the U.S., it is estimated currently that about fifteen million are over sixty-five years old, and are not cared for by an established institution or agency. This represents approximately eight per cent of the total population. Thus Blue Shield's ratio of 6.5 per cent over age sixty-five is reasonably related even now to the ratio of the total population in that group—and rapidly approaching parity with it.

Until recently, it was almost an exclusively Blue Shield feature that any member on retirement, or on leaving an insured group, could retain his coverage by "conversion" to a "direct-pay" basis.

THESE FIGURES SPEAK FOR THEMSELVES

According to the *Journal of Rehabilitation,* there are now 1,236,000 physicians serving the world's 2,700,000,000 inhabitants and the 638 medical schools operating in eighty-five countries graduate annually about 67,000 new doctors.

There are fourteen countries fortunate enough to have one doctor to serve every thousand or fewer people. But there are twenty-two others where there is only one doctor for 20,000 or more inhabitants.

While nine countries have one medical school for less than one million of population, there are thirteen countries with only one such school for nine to seventeen million people.

Of the 51,534 persons in the employ of the Department of Health, Education and Welfare, 2,376 (4.6 per cent) are in the "disabled" category.

Of the 70,940 persons rehabilitated through the state-federal program of vocational rehabilitation in fiscal 1957, approximately 53,000 were unemployed when they began to receive services. Some 14,000 had been on the relief rolls, receiving $11.4 million annually. The total, one-time cost of rehabilitating them was $11.1 million.

PHYSICIANS ARE TARGETS FOR INCOME TAX CHECKS

It is becoming increasingly apparent that the Bureau of Internal Revenue has launched a concerted campaign in an attempt to uncover suspected income-tax evaders among the ranks of the medical profession. Individual tax returns have been crossed-checked in many instances for possible discrepancies. Accuracy of employe social security and withholding tax entries have not been overlooked by representatives of the Bureau of Internal Revenue.

A careful review of daily and weekly patient fee entries recorded has been frequently noted. Scrutiny in expense claims has been the rule. Not uncommon is the fine tooth comb treatment of all the offices in an entire medical building. The doctor's secretary is not immune to a tax third-degree.

According to law, physicians in partnership must file income data with the Bureau of Internal Revenue in addition to individual returns of members of the partnership.

Penalties have been assessed in a number of instances against physicians who do not maintain depository receipts for quarterly payments of taxes.

Tax men have exercised their perogative to police the narcotic handling and recording practices.

Don't forget April 15, 1959, is the deadline for state and federal income tax returns to be filed. An ounce of precaution now may help avoid pounds of inconvenience at a later date.

PHYSICIAN'S ENTERTAINMENT EXPENSE DEDUCTIONS DEFINED

The physician's entertainment expense deductions were recently defined in a tax ruling by the Department of Internal Revenue. The ruling states:

"1. A physician may deduct on his Federal income tax return the costs of entertainment, provided he can establish to the satisfaction of the Internal Revenue Service, by appropriate evidence, that such expenses are ordinary and necessary business expenses and clearly related to the production of business income.

"2. The amount of the deduction must be proven and its reasonableness determined. Once the amount

is established, the deduction may be claimed when the doctor is able to show that the entertainment had a direct relationship to the conduct of his practice, and can show the business benefit reasonably to be expected from the expenditure. The general statement that he hoped or expected to get referrals or patients as a result of the entertainment is not enough. If personal reasons predominate, the expenditure may not be deducted, even though there is some possibility of a business benefit. Except in the case of industrial physicians, entertainment of individuals who are not doctors will not ordinarily qualify because the possibility of benefits to be expected are so remote as to be neligible. In some instances of the entertainment of patients, the same general rules apply as in the entertainment of other doctors, and the clear relationship of the expenditure to reasonably expected income must be shown. The same rules also apply to civic and other club dues.

"Criteria to be used in establishing the deductibility of entertainment expenses include, but are not limited to, the following:

(a) Specific purpose of entertainment.

(b) Nature of the practice of the doctor incurring the expenditure.

(c) Period of time the doctor has been in practice and the number of patients he already has.

(d) Percentage of his patients received as referrals.

(e) Names of individuals entertained and reason why additional income could be expected from each.

(f) Whether or not referrals were actually received from the doctors entertained and any indication of the effect of the entertainment on these referrals.

(g) Number of times individual doctors were entertained during the year, inasmuch as repeated entertainment indicates a personal motive.

(h) Whether or not other doctors in the same type practice in the locality have entertainment expenses."

Further information on the preceding cases may be obtained from the Law Department. American Medical Association, 535 North Dearborn Street, Chicago 10, Illinois.

MARRIED WOMEN PHYSICIANS STAY WITH MEDICINE

The results of a recent survey made by The Association of Medical Colleges refute the common belief that it is a waste of highly specialized education for women to study medicine when most of them abandon the profession to become housewives. The survey reveals that most women physicians practice medicine after finishing school, though some declare a brief hiatus in their careers to have children. Almost 30 per cent of the women physicians decided against marriage while approximately 3 per cent of their men colleagues are bachelors. Most popular specialties for the women M.D.'s are pediatrics, psychiatry and neurology, and obstetrics and gynecology. Few women become surgeons. An estimated 5 per cent of the nation's 7,500 medical students are women.

VARICOSE VEINS AND THE GENERAL PRACTITIONER

(Continued from Page 217)

References

1. Trendelenburg, F.: Ueber die Unterbindung der Saphena Magna Vena bie Unterschenkelvaricen. Beitr. klin. Chir., 7:195-210, 1890-91.
2. Delbet, P., and Mocquot, P.: Varices du Membre inferieur (pathogeneie et traitement). Ann. de clin. chir. du prof. Delbet: No. 2, 322p. Paris: F. Alcan, 1913.
3. Babcock, W. W.: New operation for the extirpation of varicose veins of the leg. New York J. Med., 86:153-56, 1907. (Abs.: J.A.M.A., 49:521-522, 1907.)
4. Mayo, Charles: Treatment of Varicose Veins. Surg. Gynec. & Obst., 2:385-388, 1906.
5. Matas, Rudolph: The Care and Treatment of Varicose Veins. In Keen's Surgery, Vol. V. Philadelphia: W. B. Saunders Co.
6. Homans, John: Varicose veins and ulcers. Methods of diagnosis and treatment. Boston Med. & Surg. J., 187-258, 1922. In Nelson's Loose Leaf Surgery, Nelson & Son, 3:736, 1927-1934.
7. Sigg, Karl: Varicen. Ulcus Cruris und Thrombose. Neue Wege, Zur Nichtopeativen Behandkung. Springer, Verlag, Berlin, Gottengen-Heidelberg, 1958.
8. Orbach, E. J.: Varicose Vein Injection with the "Air-Block" Technique. Am. J. Surg. Med., 54:225, 1947.
9. Ochsner, A., and Mahorner, H. R.: The modern treatment of varicose veins as indicated by the comparative tourniquet test. Ann. Surg., 107:927-951, 1938.
10. Gius, John A.: Retrograde Milking Test for Varicose Veins. J.A.M.A., 166:249 (Jan. 18) 1958.
11. McPheeters, H. O., Merkert, C. E., and Lundblad, R. A.: The mechanics of the reverse flow of blood in varicose veins and its relation to the injection treatment. Surg. Gynec. & Obst., 55:298-302 (Sept.) 1932.
12. McPheeters, H. O., and Kusz, Clarence V.: The care and treatment of varicose veins. Am. J. Sur., 88:568-573 (Oct.) 1954.
13. Lofgren, Karl A., Ribisi, Albert P., and Meyers, Thomas P.: An evaluation of stripping versus the ligation treatment of varicose veins. J.A.M.A. Surg., 76:319-316 (Feb.) 1958.

Physicians and Surgeons Building
Minneapolis 2, Minnesota

Minnesota Blue Shield—Blue Cross

More than $50,000,000 has been paid by Minnesota Blue Shield for doctors' services rendered participant subscribers since the Plan began operations in November, 1947. This milestone was attained during December, 1958, and as of December 31, 1958, Blue Shield allowances for physicians' services during slightly more than eleven years of operation totaled $50,262,000.

The tremendous progress made by Minnesota Blue Shield in eleven years of operation is shown by the fact that during 1958 alone, nearly $10,000,000 was paid for physicians' services rendered subscribers, actually $9,686,819. This figure greatly exceeds Blue Shield allowances in any previous year and it surpasses the 1957 total by more than $1,200,000, or nearly 15 per cent. During the twelve months of 1958, Blue Shield payments for doctors' services rendered participant subscribers averaged over $807,000 each month.

Similarly, the number of doctors' services for which Blue Shield made payments in 1958 far exceeded the number of services for which allowances were made by Blue Shield in any previous year. During 1958, Blue Shield made allowances for 365,654 doctors' services, 58,483 or 19 per cent more services than were provided Blue Shield allowances during 1957.

Blue Shield participant subscribers numbered 889,943 as of December 31, 1958, approximately 20,000 more than the number of participant subscribers as of the same date in 1957. Percentage-wise, the increase in the number of participant subscribers is much less than the increases in payments and doctors' services which are apparently attributable to greater utilization of the contract by participant subscribers and the continued expansion of the contract in providing allowances for more of the services rendered by doctors of medicine.

Minnesota Blue Cross completed its twenty-fifth year of service during 1958. Since March, 1933, Minnesota Blue Cross has provided 15,187,515 days of hospital care benefits to 2,498,074 participant subscribers. Nearly 210,000,000 has been expended by Blue Cross for these hospital services provided.

The year 1958 shattered all previous records of hospital utilization incurred by Blue Cross subscribers. The 215,729 hospital cases paid represented more than one case incurred by every two contracts in effect. The 1,332,580 days of hospital care provided was an increase of 99,088 days over the previous high recorded during 1957 and represented over three days of hospital care provided for each contract in effect. Hospitalization expense during the year totaled $33,894,967, an increase of $5,262,562 over 1957 experience.

The phenomenal increase in Blue Cross utilization continues to be attributable to the rising trend of hospital costs and increased subscriber usage of Blue Cross benefits. Nearly seventy per cent of the increased subscriber usage is attributable to the increased numbers of subscribers hospitalized for medical care. Within the medical care area, two-thirds of the increase is due to subscribers incurring hospital medical care due to diseases of the digestive system.

Blue Cross membership as of December 31, 1958 totaled 1,143,467 participant subscribers, an increase of 5,500 over the number of participant subscribers protected as of the same date a year ago.

The Art of Medicine

PR

Carl H. Woyke, B.A.
Editor

"DEAR DOCTOR" LETTERS EXPRESS DESIRE FOR MORE HEALTH INFORMATION

We get letters—lots and lots of letters. The mail response to the Minnesota State Medical Association programs, "Doctor's House Call," and "Your Health" on WCCO radio, as well as the "Doctor, Tell Me" series are at an all time high.

Unlike Perry Como's letters, which we assume relate to the lighter side of life, each of these letters is written testimony to some individual in need of a clearer explanation from the individual's personal physician regarding a particular health problem.

This is all the more reason why it is important for the physician to present answers to his patient's health questions in lay terms—easily understood by the patient.

PHYSICIANS HOLD PROFESSIONAL LEADERSHIP IMPROVEMENT FORUM

Several hundred Buffalo, New York, area physicians recently became "patients" as eight experts diagnosed their social, economic and civic "health" in a unique meeting.

The occasion was a forum on "The Doctor and His Practice" co-sponsored by the Erie (New York) County Medical Society and The Wm. S. Merrell Company, Division of Vick Chemical Company, at the Statler-Hilton Hotel. It was the second in a series of national medical economics meetings presented as a service to physicians by Merrell, century-old Cincinnati, Ohio, ethical pharmaceutical manufacturer.

Doctors attending the meeting were counseled on improving their dealings with patients, staff and community; their office and business management procedures; protecting themselves against professional liability suits; selecting their investments, insurance and planning their estates.

The physicians were advised by the experts that doctors can no longer rely solely on cultivating clinical skills. They must take the responsibility for improving their relationships and developing medical services that answer the changing needs of American society.

They were also warned that their professional future dictates that doctors find the time now to educate themselves on their individual and social responsibilities, lest they abdicate medical leadership entirely tomorrow.

Those conducting the forum also predicted that American physicians have the wisdom and resources to meet the challenge of these new social and economic problems in medicine.

ORIENTATION WORKSHOP

An orientation workshop for new component medical society presidents and secretaries, was recently sponsored by the Medical Association of Georgia. Purpose of the workshop conference was to afford newly elected county society officers an opportunity to learn about the function of society operations.

"Structure of County Society Organization," "County Society Management," "County Society Public Service," "Outstanding Examples of County Society Activity," and how "Medical Association of Georgia Can Help Your Society," were topics discussed at the one-day session. All officers of the seventy-county society association of Georgia received invitations to attend. Mr. Leo A. Brown, Director of the Communications Division, American Medical Association, was among the program speakers.

HUMAN RELATIONSHIPS According to Woodrow Wirsig, editor of Printers' Ink, New York, a survey of editors discloses the feeling that "medicine today is dangerously impersonal." Many editors, Mr. Wirsig said, "receive a floor of 'help-me' letters" from people who are desperately in need of a "personal relationship with a doctor they can trust as a friend and counselor."

As a yardstick for professional action, Mr. Wirsig urged that doctors undertake a continuing study of the public's attitude toward medicine and "what people want from doctors."

Treatment of the patient "begins in the waiting room," John R. Sedgwick, Chicago medical office management consultant, told the physicians' meeting. "The patient expects consideration for his comfort as well as his ills. Nobody likes to be kept waiting too long, including the patient," Mr. Sedgwick pointed out. This consideration might even logically begin outside the office, with adequate provision of parking facilities for the patient, he added.

A SLIP OF THE TONGUE COULD BE COSTLY "Be as careful with your tongue as you are with your scalpel", Erie (New York) County Medical Society members were advised at the same forum on "The Doctor and His Practice." The advice was presented by Mr. R. Crawford Morris, veteran attorney.

Other recommendations given by Mr. Morris to avoid possible liability suits were:

1. Never guarantee a cure unless you mean to be held to it.
2. Watch the time factor. In most states the patient has one year within which to sue you for malpractice, whereas you have six years within which to sue her for your bill. (In Minnesota, it is two years from the date of last treatment.)
3. Keep up with the advance of medicine.
4. Do not experiment unless you have the patient's permission in writing.
5. Get the patient's consent for everything you do, preferably in writing.
6. Good housekeeping. Keep good records, full and adequate.
7. Do not be negligent. If you feel the case is beyond your experience, do not hesitate to call for a consultation and make a writteen record of the consultant's opinion.

FOOD FOR FUTURE THOUGHT A one-day Public Relations Institute was recently conducted by the Medical Society of New Jersey. The event was sponsored by the Medical Society of New Jersey in conjunction with the Subcommittee on Public Relations. Its purpose was to review all the pressing problems of public relations concerning the state society and its component societies, and through formal presentation and from discussions, to agree upon steps to deal with the situation.

Invitations were sent to all officers and board members of the Medical Society of New Jersey; to the members of the Subcommittees on Public Relations and Medical Practice; to the presidents, secretaries, and executive secretaries of component societies; to all chairmen of public relations committees of component societies, and to representatives of the Women's Auxiliary.

"Analyzing our problems," was the title of the opening morning session devoted to a panel of speakers who discussed critical phases of medical public relations.

The afternoon session was dedicated to "Finding Solutions" for problems discussed in the morning session.

The opening topic discussed at the morning session was "Medical Public Relations—Philosophically and Practically Considered." Other topics discussed included: Medical Public Relations and the Individual Physician; Organized Medicine; Economics; Legislation; and the Common Good.



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SEARLE

Meetings and Announcements

NATIONAL

American College of Surgeons sectional meetings:

April

Four-day Sectional Meeting for Surgeons and Nurses, The Queen Elizabeth Hotel, Montreal, Quebec, April 6-9. Drs. Harry S. Morton and Charles Edouard Hebert, Montreal, Local Chairmen for Surgeons Meeting; Miss Moyra Allen and Sister Denise Lefevre, Montreal, Local Chairmen for Nurses Meeting; Dr. Michael L. Mason, Secretary, 40 East Erie Street, Chicago 11, Illinois.

September

Annual Clinical Congress, Atlantic City, New Jersey, September 28-October 2. Dr. Michael L. Mason, Secretary, 40 East Erie Street, Chicago 11, Illinois.

The American College of Chest Physicians, Silver Anniversary Meeting, Ambassador Hotel, Atlantic City, June 3-7, 1959.

Oregon Cancer Conference, sponsored jointly by the Oregon State Medical Society, the Oregon Division of the American Cancer Society, the University of Oregon Medical School and the Oregon Academy of General Practice, July 16-17, 1959, Portland, Oregon.

Pan-Pacific Surgical Association, Eighth Congress, Honolulu, Hawaii, September 28 through October 5 in 1960. Further information and brochures may be obtained by writing to Dr. F. J. Pinkerton, Director General of the Pan-Pacific Surgical Association, Suite 230, Alexander Young Building, Honolulu 13, Hawaii.

Society of Nuclear Medicine, Sixth Annual Meeting, The Palmer House Hotel, Chicago, Illinois, June 18-20, 1959.

INTERNATIONAL

Association of the National European and Mediterranean Societies of Gastroenterology sixth meeting, Leiden, The Netherlands, April 20 to 24, 1960.

Seventh Bahamas Medical Conference, British Colonial Hotel, Nassau, Bahamas, March 30 until April 11, 1959.

Eighth Bahamas Medical Conference, British Colonial Hotel, Nassau, Bahamas, November 27 until December 17, 1959.

Second Bahamas Surgical Conference, British Colonial Hotel, Nassau, Bahamas, December 28, 1959 until January 16, 1960.

International Academy of Proctology, Eleventh Annual Convention, The Plaza Hotel, New York, New York, April 5 through 9, 1959.

International College of Surgeons, Twelfth Biennial International Congress, Rome, Italy, May 15-18, 1960.

North American Federation, Twenty-Fourth Annual Congress, International College of Surgeons, Chicago, September 13-17. For information, write The Secretariat, International College of Surgeons, 1516 Lake Shore Drive, Chicago 10.

NEW YORK UNIVERSITY POSTGRADUATE MEDICAL SCHOOL

Surgery of The Hand—a full-time course, March 16 through 21.

Orthopedic Aspects of The Treatment of Rheumatic Disorders—a part-time course on three successive Tuesdays, 9 a.m. to 5 p.m., March 17-31.

Refresher Course in Allergic Conditions—a full-time course, March 23-25.

Seminar in Internal Medicine—Full-time course, April 6-May 29.

WORLD MEDICAL ASSOCIATION TOUR

Pre-convention tour leaving New York City for Vienna on August 3, 1959. In Vienna, group will attend the Congress on Internal Medicine, then proceed to Kiev, Leningrad, Moscow, Warsaw and Prague (August 8 to 28). Return to Chicago, August 30 to attend Second World Conference on Medical Education; on September 5, travel to Montreal for XIIIth General Assembly of The World Medical Association.

Following the XIIIth General Assembly in Montreal, September 7-12, the tour will leave for Munich, September 13, for attendance at the 18th Congress of International Society of Surgery; visit Vienna, Rome, Barcelona, Madrid and Paris (September 20 to October 12); 8th International Congress on History of Medicine in Barcelona; and return to New York City on October 13, 1959.

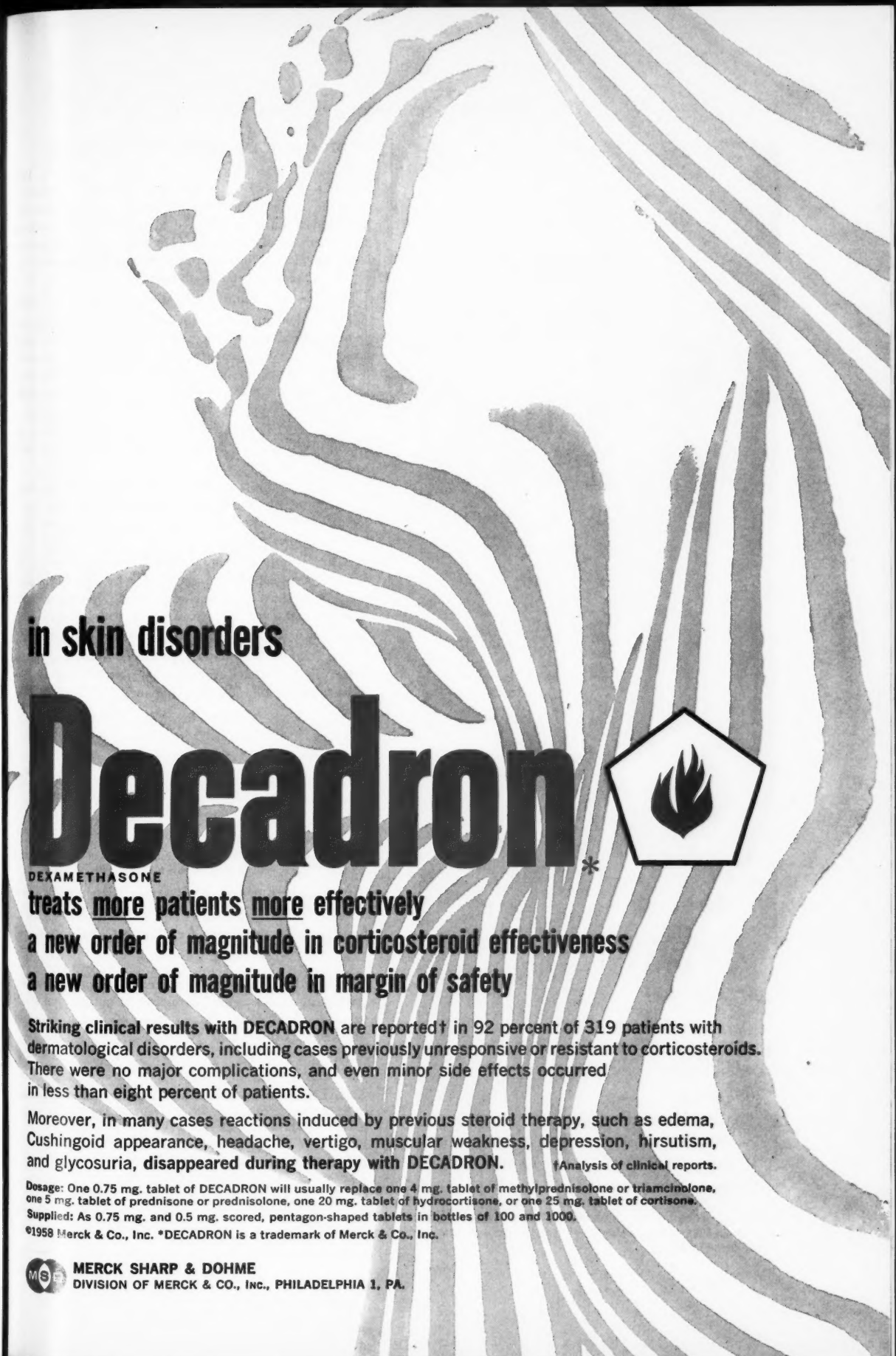
PROGRAM ARRANGEMENT AVAILABLE TO COUNTY SOCIETIES

A program on the treatment of arthritis and rheumatic diseases can be arranged for County Medical Societies. The Minnesota State Medical Association and the Minnesota Chapter of the Arthritis and Rheumatism Foundation are co-sponsors. The program can be arranged for one hour or one and a half hours followed by a question-and-answer period.

Two or three speakers will be provided consisting of an orthopedist, physiatrist, and a rheumatologist who is also an internist or pediatrician. A choice of speakers from this state chosen from these specialties will be provided insofar as possible. Substitute speakers will be provided if the speaker who is requested cannot participate. For arrangement of speakers for a county medical meeting, write C. H. Slocumb, M.D., 200 First Street, S.W., Rochester, Minnesota. Allow six to eight weeks when possible to make arrangements.

These programs are being subsidized by the Minnesota Chapter of the Arthritis and Rheumatism Foundation.

(Turn to page 286)


in skin disorders
Decadron*
DEXAMETHASONE
treats more patients more effectively
a new order of magnitude in corticosteroid effectiveness
a new order of magnitude in margin of safety
Striking clinical results with DECADRON are reported† in 92 percent of 319 patients with dermatological disorders, including cases previously unresponsive or resistant to corticosteroids. There were no major complications, and even minor side effects occurred in less than eight percent of patients.
Moreover, in many cases reactions induced by previous steroid therapy, such as edema, Cushingoid appearance, headache, vertigo, muscular weakness, depression, hirsutism, and glycosuria, disappeared during therapy with DECADRON.
†Analysis of clinical reports.
Dosage: One 0.75 mg. tablet of DECADRON will usually replace one 4 mg. tablet of methylprednisolone or triamcinolone, one 5 mg. tablet of prednisone or prednisolone, one 20 mg. tablet of hydrocortisone, or one 25 mg. tablet of cortisone.
Supplied: As 0.75 mg. and 0.5 mg. scored, pentagon-shaped tablets in bottles of 100 and 1000.
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MEDICAL SOCIAL WORK SCHOLARSHIPS

Students attending any approved graduate professional school of social work offering a medical social field work placement are eligible for scholarships. The student must be accepted for admission by a school accredited by the Council on Social Work Education but may file application for a scholarship pending acceptance for admission to the school.

Deadline for filing applications is April 1, 1959.

The student must have the intention of including the medical social field work placement in his educational program and of completing his study for the Master's degree. Scholarships are ordinarily offered for the final year of the graduate program, but a few scholarships are awarded to well-qualified students for both years.

Applicants must be citizens of the United States or have filed a petition for naturalization. The age limit is thirty-eight.

Scholarship awards are based on the needs of students and will ordinarily include financial assistance for maintenance and for tuition. No allowance for fees will be made.

A new scholarship program for students entering the junior year of college and planning to prepare for medical social work has just been announced. For information relative to this program, students are advised to consult the Dean of any college or university they are attending.

For further information on either program, please write: The National Foundation, Department of Professional Education, 800 2nd Avenue, New York 17, New York.

CONTINUATION COURSES

Medical continuation courses to be presented at the Center for Continuation Study, University of Minnesota, are as follows:

March 30-April 3—Basic Concepts of Water and Electrolyte Balance for General Physicians

April 2-4—Emergency Surgery for General Physicians

April 6-8—Radiology for General Physicians

April 16-18—Allergy for General Physicians and Specialists

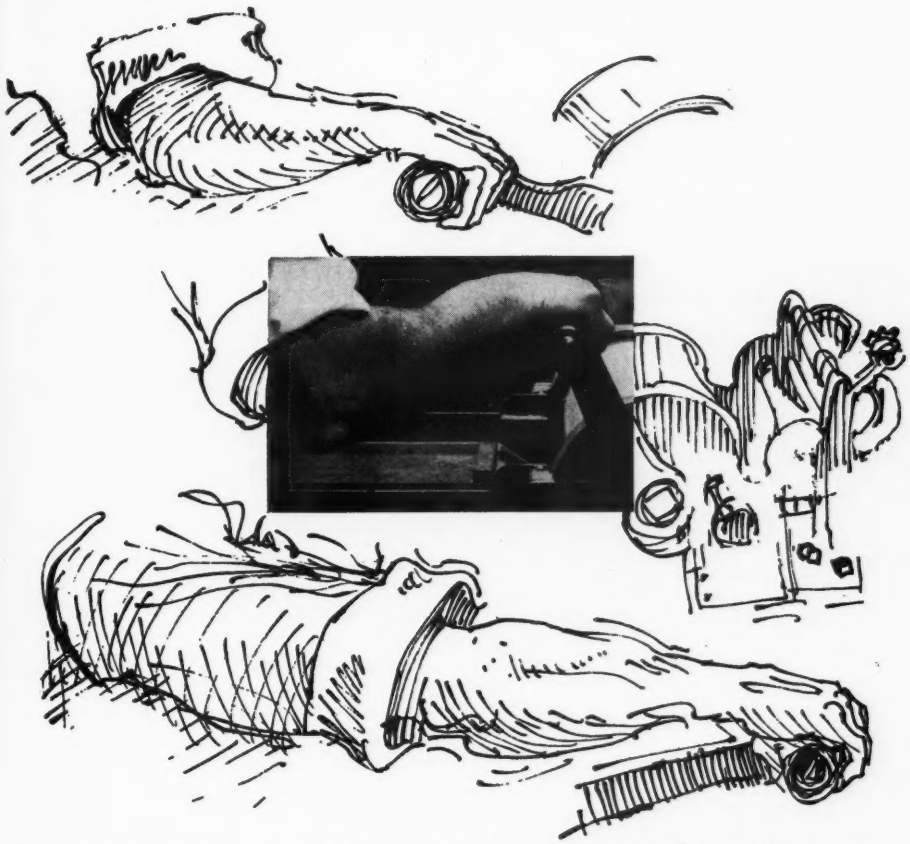
For further information concerning the above courses, write to the Director, Department of Continuation Medical Education, 1342 Mayo Memorial, University of Minnesota, Minneapolis 14, Minnesota.

MINNESOTA STATE MEDICAL ASSOCIATION

Annual Meeting

Duluth

May 25-27, 1959



To the relief of musculoskeletal pain, new MEDAPRIN* adds restoration of function

Analgesics offer temporary relief of musculoskeletal pain, but they merely *mask* pain rather than getting at its *cause*. New Medaprin, in addition to bringing about prompt subjective improvement, promotes the *restoration of normal function* by suppressing the inflammation that *causes* the pain.

Medaprin, Upjohn's new analgesic-steroid combination, contains aspirin plus Medrol,** the corticosteroid with *the best therapeutic ratio in the steroid field.*† Instead of suffering recurrent discomfort because of the "wearing off" of analgesics, the patient on Medaprin experiences a smooth, *extended* relief and more normal mobility.

Indications: Medaprin is indicated in mild-to-moderate rheumatic and musculoskeletal conditions, including rheumatoid arthritis, deltoid bursitis, low back pain, neuralgia, synovitis, fibromyositis, osteoarthritis, low back sprain, traumatic wrist, sciatica, and "tennis elbow."

Dosage: The recommended dosage is 1 tablet q.i.d. The usual cautions and contraindications of corticotherapy should be observed.

Supplied: In bottles of 100 and 500.

Formula: Each Medaprin tablet contains

- 300 mg. acetylsalicylic acid, for prompt relief of pain
- 1 mg. Medrol, to suppress the causative inflammation
- 200 mg. calcium carbonate, as buffer

*TRADEMARK **TRADEMARK, REG. U. S. PAT. OFF.— METHYLPREDNISOLONE, UPJOHN
†RATIO OF DESIRED EFFECTS TO UNDESIRED EFFECTS

The Upjohn Company, Kalamazoo, Michigan **Upjohn**

Communications

In a recent issue of MINNESOTA MEDICINE, Volume 42, page 14, January, 1959, comment has been made by Drs. Winkelmann and Brunsting of chelation therapy in Scleroderma.

I should like to call attention to an important distinction in the drug used by these authors. The article states ". . . the use of edathamil disodium (Calcium disodium) versenate by intravenous infusion." Edathamil disodium, prepared by the Abbott Company, is not calcium disodium versenate. Edathamil disodium, the drug exhibited in the authors' cases, is a member of a fairly broad group of the ethylenediamine terta-acetic acid series. I do hope that your Journal will emphasize this observation.

May I likewise call attention to our encouraging results in the treatment of acrosclerotic scleroderma by means of Edathamil (Na_2-EDTA) reported in the *Journal of Investigative Dermatology* (Rukavina, J. G. et al, Vol. 29:273-287, October, 1957; and Price, J., M.D., Ph.D., et al, Vol. 29:289-298, October, 1957).

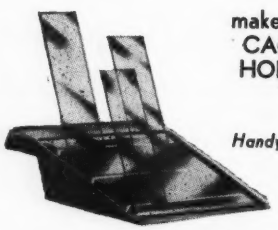
In this series of publications, we reported not only the clinical results in a series of cases, but also emphasized an apparent biochemical aberration in tryptophan metabolism in these subjects—a fault heretofore not described. We likewise reviewed the chemistry and pharmacology of these compounds and their possible application in clinical medicine.

JOHN G. RUKAVINA, M.D.

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This Section is for you to voice your convictions, comments, and queries on all subjects political, economic, historic, humorous, scientific or otherwise, to many physicians. Writings not sufficiently formal and too brief for an editorial or a scientific manuscript are requested. Clinical and research observations, no matter how brief, similar to those in *The Lancet* (London), are particularly encouraged.

Thank you for sending me the copy of MINNESOTA MEDICINE for January, 1959, which contains the editorial that I prepared.

May I congratulate you at once on the quality of MINNESOTA MEDICINE. This is the first time in some years that I have looked it over carefully. Certainly it would rank now as among the best, if not the best, of the state medical journals.

The quality of the typography, the diversification of content, and the up-to-dateness of its news all speak in favor of its usefulness as a state medical journal. Because of the quality of clinical study and research done in the state of Minnesota, your original contributions have a high rating in my estimation.

I have read the whole issue carefully and I found only two typographical errors, although there may be more. . . .

With my best wishes,

Sincerely yours,
MORRIS FISHBEIN

Chicago, Illinois
February 3, 1959

* * *

Congratulations on the handsome changes made in your journal. You have produced a feeling of freshness and vitality which will be enjoyed by your readers. I am sure that you have received many compliments by this time.

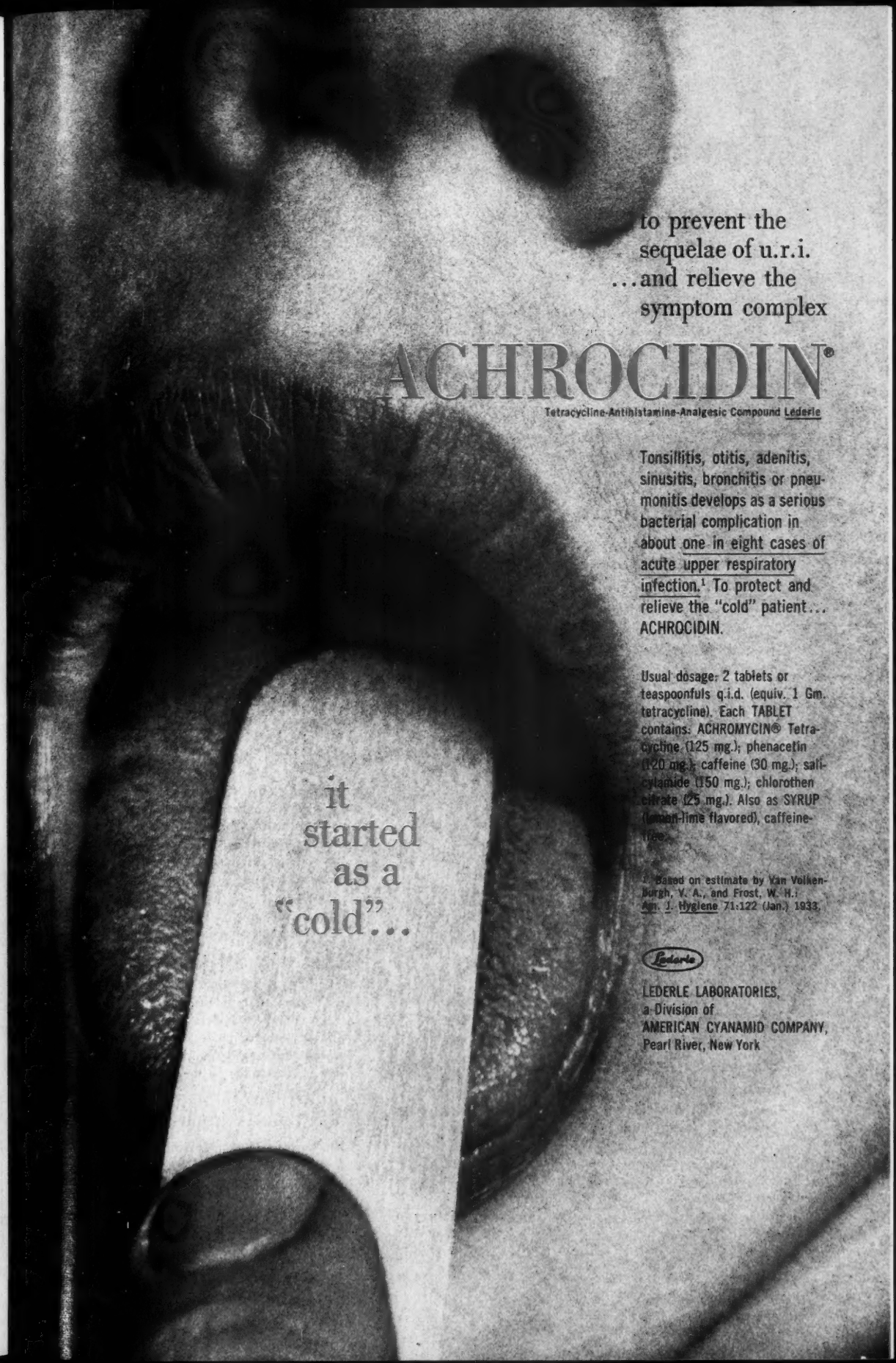
Competition in the state and regional journal group is getting tough. Some very fine jobs are being done and now you have moved up among the leaders. Nice going.

Sincerely,
H. L. HARTLEY, M.D.
Editor, Northwest Medicine

Seattle, Washington
February 5, 1959

Is there any special "trick" to leg bandaging as an aid to treatment of refractory cardiac failure?

Yes. Perhaps the most important factor is proper timing, it has been found. The most propitious time to bandage and elevate the legs is on the day when a mercurial injection is administered. This has reportedly helped to increase the extent and duration of diuresis. However, for optimum effect, the physician is advised to observe the precaution of waiting for definite diureses to be well started before proceeding with the bandage.



to prevent the sequelae of u.r.i. ...and relieve the symptom complex

ACHROCIDIN®

Tetracycline-Antihistamine-Analgesic Compound Lederle

Tonsillitis, otitis, adenitis, sinusitis, bronchitis or pneumonitis develops as a serious bacterial complication in about one in eight cases of acute upper respiratory infection.[1] To protect and relieve the "cold" patient... ACHROCIDIN.

Usual dosage: 2 tablets or teaspoonfuls q.i.d. (equiv. 1 Gm. tetracycline). Each TABLET contains: ACHROMYCIN® Tetracycline (125 mg.); phenacetin (120 mg.); caffeine (30 mg.); salicylamide (150 mg.); chlorothen citrate (25 mg.). Also as SYRUP (lemon-lime flavored), caffeine-free.

1. Based on estimate by Van Volkenburgh, V. A., and Frost, W. H.: Am. J. Hygiene 71:122 (Jan.) 1933.

Lederle

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Pearl River, New York

Woman's Auxiliary

MAKE ANNUAL MEETING PLANS NOW

The Woman's Auxiliary to the Minnesota State Medical Assocation, will hold its thirty-seventh annual convention at Duluth, on May 25, 26, and 27. Headquarters for the convention will be the Hotel Duluth, and registration will be held on the mezzanine floor.

The Executive Board's annual meeting and luncheon will be held on Monday, May 25, at the Kitchi Gammi Club. This meeting will commence promptly at 10:30 a.m., and is open to any member of the Auxiliary who wishes to attend.

A tea is planned for Monday afternoon, May 25, at 3:00 p.m., at the Tweed Art Gallery on the University of Minnesota Duluth Branch Campus. All visiting women will be the guests of the Woman's Auxiliary to the St. Louis County Medical Society.

The annual meeting of the state auxiliary will be held on Tuesday, May 26, at 9:30 a.m. in the Arrowhead Room at the Hotel Duluth. Following the meeting is the annual luncheon, 1:00 p.m., at which Mr. Eugene R. Lambert, former Mayor of Duluth, will speak. His topic will be "What the Seaway will mean to Minnesota."

Tuesday evening at 7:00 p.m., the banquet for doctors and wives will be held in the ballroom of the Hotel Duluth.

Concluding the auxiliary activities will be a "round-up" breakfast at the Duluth Women's Club, planned for Wednesday, May 27, at 10:30 a.m.

More specific information will be published prior to the meeting, but it is anticipated that this "preview" will stimulate many members to make plans to attend this well-planned convention at Duluth.

MID-WINTER BOARD MEETING SUCCESSFUL

The annual mid-winter board meeting of the Woman's Auxiliary to the Minnesota State Medical Association was held February 2, 1959, in the Women's City Club in St. Paul.

Guest luncheon speaker was Dr. E. W. Ziebarth, radio news analyst. He presented an illustrated lecture concerning his recent trip to Russia.

Chairman in charge of the arrangements for the event was Mrs. William Von der Weyer. Hostesses helping her were Mrs. Harold Peterson, Mrs. Leo Nash and Mrs. Grant R. Diessner.

RAMSEY COUNTY BOARD ENTERTAINS

Members of the Woman's Auxiliary to the Ramsey County Medical Society were guests when "Luncheon-Varieties '59" was presented by the auxiliary board in the Women's City Club in St. Paul recently.

The event began with a social hour and noon luncheon. Mrs. Douglas R. Kusske and Mrs. James R. Ralph were in charge of the program featuring a skit by board members. Mrs. William Menold and Mrs. Jack Murphy handled reservations.

RED CARNATION BALL HONORS DOCTOR HUSBANDS

Saturday, February 7, was the date of the annual Red Carnation Ball given by the Woman's Auxiliary to the Hennepin County Medical Society to honor their husbands. Two hundred and thirty doctors and their wives attended the party at the Interlachen Country Club. One of the high spots of the party each year occurs when each wife pins a red carnation on her husband's lapel. This tradition had its origin from the deep south where the red carnation was given as a token of appreciation by patients on a day specified as "Doctor's Day."

This year, the ball had a valentine's motif. The profusion of valentine hearts made of red, white and pink ribbon bows most artistically and effectively complemented the traditional red carnation theme.

Chairmen of the decorations and all arrangements for the ball was Mrs. Robert G. Tinkham. The Auxiliary extends its congratulations and appreciation to Mrs. Tinkham and her committee for this most beautiful and memorable occasion.

ST. LOUIS COUNTY AUXILIARY ACTIVITIES

The St. Louis County Medical Auxiliary began its year with the customary business meeting, followed by a membership tea.

The topic for the November meeting was "Health Facilities in St. Louis County, How Administered and How Financed." Mr. Ove Wagensteen discussed the subject most interestingly and informatively.

In January, ten Auxiliary members brought as their guests a potential or new member. The program consisted of a tour of the Leonardo da Vinci exhibit, "Models of Inventions," with a commentary by Mr. William Boyce of the University of Minnesota, Duluth Branch Art Department. The exhibit was on display at the new Tweed Art Gallery, which added to the interest of the program.

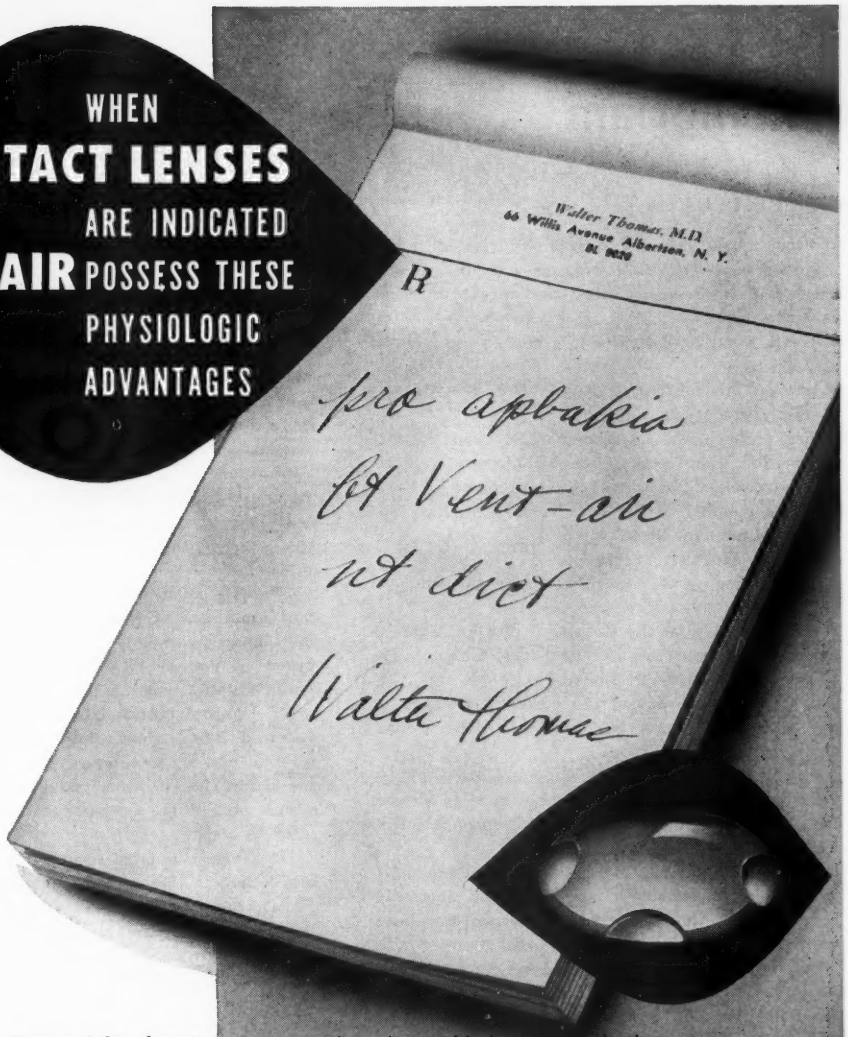
In addition to a rummage sale in the fall, which netted $300.00, other accomplishments have included: three nurses scholarships, totaling $400; $150 for AMEF; twenty-one subscriptions to *Today's Health* for Duluth schools and institutions; preparation of refreshments for a USO party; and donations to most of the Auxiliary philanthropic commitments.

Also, Auxiliary members staffed and were responsible for Stork Photography at St. Luke's Hospital, which is a part of the Ladies Guild volunteer program. From the first of September to the first of January, this group of workers made $374.07 for the Guild.

MOWER COUNTY HOLDS CAREERS DAY

The Mower County Medical Auxiliary recently sponsored its annual program to give high school girls of that area career information on nursing and medical sciences. An estimated 175 Austin High School and Pacelli High School students participated in the program.

WHEN
CONTACT LENSES
ARE INDICATED
VENT-AIR POSSESS THESE
PHYSIOLOGIC
ADVANTAGES



Four peripheral vents	Permit topical circulation of lachrymal and glandular secretions without excessive motility
Corneal apical clearance	Favors normal corneal metabolism and oxygenation
Ultra-Smoothness of Inner and Outer Surfaces	Avoid limbal epithelial and tarsal conjunctival exacerbation
Highly absorptive methyl-methacrylate composition	Simulates "wetting" and moisture-retention properties of cornea (of military specification)
Precision-ground	Prescriptive qualities exact to ± 0.12 D. with precise allowance for vertex refraction and lachrymal factor (exact to .02 mm radius in inner curvature)
Custom-fitted	In uni-, bi-, or tri-curve radii conforming to corneal peripheral asphericities
Hyper-thinness of edge or center	Maintains uniform thickness in high myopia or hyperopia approximating .20 mm irrespective of power
Widest range of inner radii	From 5.0 to 10.00 mm providing for extremes of keratoconic and megaloglobic dimensions
Cosmetic, pin-hole and tinted effects	For leucomatous, polyopic, iridodialytic and albinic conditions or other corneal or media anomalies.

VENT-AIR CONTACT LENS LABORATORIES • NEW YORK, N. Y.

In Memoriam

FREDERICK U. DAVIS

Dr. Frederick U. Davis, Faribault physician, died Friday, January 23, 1959, following an extended illness. The deceased was eighty-three years old at the time of his death.

Dr. Davis, a native of Faribault, served in the Spanish American War.

He received his medical education from the University of Minnesota Medical School.

His first practice was established in St. Clair, Minnesota. In 1906, Dr. Davis moved his practice to Faribault and continued there until his retirement in 1937.

He was a member of the Rice County Medical Society, the Minnesota State Medical Association, and the American Medical Association.

He had served as Health Officer for the City of Faribault for a number of years.

He was a member of the Cathedral of Our Merciful Saviour and had served on the Cathedral Chapter. He was a member of Faribault Lodge No. 9 AF and AM. He was a charter member of the Faribault Chapter of Rotary International and had served as the second President of that organization.

He was also a member of the William Kane Camp—United Spanish American War Veterans. He served for many years as the head of the Rice County Selective Service Board.

Dr. Davis was a moving figure in the development of the Boy Scout movement in the Faribault area. He had served as the Area Council President and had been instrumental in bringing about the affiliation of this area with the National Boy Scout Movement. He was an honorary life member of The Indian Head Council—Boy Scouts of America, and he was the recipient of the Silver Beaver Award for distinguished service to boyhood.

Dr. Davis is survived by his wife Erna; by two sisters, Miss Alice Davis and Miss Katharine Davis, Minneapolis; and by a niece Miss Elizabeth Redway, Tacoma, Wash.

ADOLPH M. HANSON

Dr. Adolph M. Hanson, Faribault physician, died January 15, 1959. He was seventy years old at the time of his death.

For more than forty-five years, the deceased had practiced medicine in Faribault.

He was born in St. Paul, Minnesota, and received his early education at Red Wing Seminary. He obtained his premedical and medical education at the following colleges and universities: Hamline University, University of Minnesota, Northwestern University and the University of Pennsylvania School of Neurosurgery, where he did graduate work. Dr. Hanson also received an A.B. degree from St. Olaf College, Northfield in 1922, a Masters Degree in 1923 and an Honorary Doctor of Science Degree in 1943.

He began practice of medicine in Red Wing in 1911 and moved to Faribault in 1912.

For many years, Dr. Hanson was in charge of the Hanson Research Laboratory in Faribault, which specialized in the research of glands of internal secretion.

He served as Neurosurgeon, Evacuation Hospital, 8 A.E.F., World War I. He was a member of Rice County Medical Society, the Minnesota State Medical Association and the American Medical Association. In addition, he was a member of the American Chemical Society, Association of Military Surgeons of the United States, Association for Study of Internal Secretions, and the American Medical Editors and Authors Association.

He was awarded first prize for work on the parathyroid gland by the Minnesota Society of Internal Medicine in 1927.

He was the author of "Practical Helps in the Study and Treatment of Head Injuries" 1925; also a chapter on Management of Gunshot Wounds of the Head and Spine, in Volume XI, The Medical Department of the United States Army in the World War.

Dr. Hanson contributed numerous articles on parathyroid and thymus glands, head, spine and superficial nerve surgery, and other subjects. He was the discoverer of the parathyroid thymus and pineal active extracts; inventor of a dural separator and bone elevator used in brain surgery.

Dr. Hanson donated scientific equipment of the Hanson Research Laboratory to the chemistry department of St. Olaf College in Northfield in July, 1942, to be perpetuated as a special laboratory for advanced study.

He is survived by his wife, Lucille; three daughters, Mrs. Joseph Kuhlmann (Jane) Irvington-on-Hudson, N. Y.; Mrs. George Holdy (Anne) Minneapolis and Mrs. Charles Synder (Patricia) North Branford, Conn.; a son, Adolph Hanson, St. Paul; a brother, George Hanson, Kenyon, nine grandchildren and one great grandchild.

EDWARD A. MEYERDING

Dr. E. A. Meyerding, retired Executive Secretary of the Minnesota Tuberculosis and Health Association, died January 23, 1959. He was eighty years of age at the time of his death.

From 1924 to 1937, he served as executive secretary of the Minnesota State Medical Association. Dr. Meyerding, who served as director of hygiene for the St. Paul Public Schools from 1909 to 1924, was frequently referred to as St. Paul's first "school physician."

In 1956, Dr. Meyerding received the William G. Anderson award of the American Association for Health, Physical Education and Recreation, for his work with Minnesota school children.

He was a native of St. Paul and received his early education at Mechanic Arts High School. A graduate of the University of Minnesota School of Medicine, he

(Continued on Page 300)



running noses and open stuffed noses orally



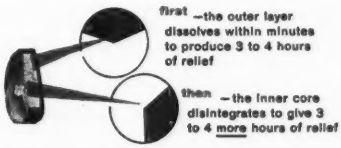
with TRIAMINIC, the oral nasal decongestant

- in nasal and paranasal congestion
- in sinusitis
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- in allergic reactions of the upper respiratory tract

safer and more effective than topical medication

- reaches *all* respiratory membranes systemically
- avoids "nose drop addiction"
- presents no problem of rebound congestion
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Relief with Triaminic is prompt and prolonged because of this special timed-release action . . . beneficial effect starts in minutes, lasts for hours.



Each* TRIAMINIC *Tablet provides:

Phenylpropanolamine HCl . . .	50 mg.
Pheniramine maleate	25 mg.
Pyrilamine maleate	25 mg.

One-half of this formula is in the outer layer, the other half is in the core.

Dosage: One tablet in the morning, mid-afternoon and in the evening, if needed.

Triaminic®

Also available: For the occasional patient who requires only half dosage: timed-release TRIAMINIC JUVELETS. Each Juvelet is equivalent to ½ of a Triaminic Tablet.

For those patients who prefer liquid medication: TRIAMINIC SYRUP. Each 5 ml. tsp. of this palatable syrup is equivalent to ¼ of a Triaminic Tablet.

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NOW—YOU CAN GET THE
UNSURPASSED ADVANTAGES
OF ARISTOCORT
IN SALICYLATE
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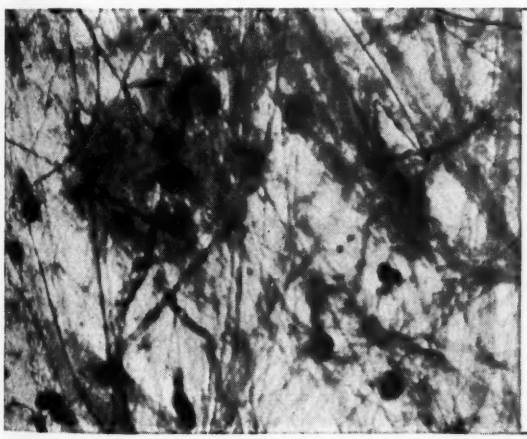
Aristogesic combines the *anti-inflammatory* effects of Aristocort® Triamcinolone with the *analgesic* action of a most potent salicylate. This means that the dosage of each is *substantially lower* than that ordinarily required for each agent alone. With Aristogesic the physician has exceptionally wide latitude in adjusting the dosage to the lowest effective level.

The possibility of gastric distress from either salicylamide or corticosteroid is minimized because of lower dosage required. This is further reduced by the buffer action of aluminum hydroxide. And the ascorbic acid helps meet the increased need for this vitamin in stress conditions. Because of the low dosage, side effects with Aristogesic have been relatively infrequent and minor in nature. However, more serious side effects have traditionally been observed on all corticosteroid therapy. Patients on long-term Aristogesic therapy should, therefore, be observed carefully.

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Steroid—Analgesic Compound LEDERLE

for relief of *chronic*—but *less severe* pain of rheumatic origin



Indications: Mild cases of rheumatoid arthritis, tenosynovitis, synovitis, bursitis, mild spondylitis, myositis, fibrositis, neuritis and certain muscular strains.

Dosage: Average initial dosage: 2 capsules 3 or 4 times daily. Maintenance dosage to be adjusted according to response.

Each Aristogesic Capsule contains:

ARISTOCORT® Triamcinolone . . . . 0.5 mg.
Salicylamide . . . . 325 mg.
Aluminum Hydroxide . . 75 mg.
Ascorbic Acid . . . . . 20 mg.

Supply: Bottles of 100.

Collagen tissue (x250)

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this economical
P&H *TREATMENT TABLE*
meets the need for efficiency and high quality



STURDY—FINELY CONSTRUCTED—MADE OF GENUINE CANADIAN BIRCH

With the growth of the medical clinic there has come the need for a new type of table. The P&H TREATMENT TABLE meets that need with both style and economy. We know you will agree that this is the best table value in years. It is a quality table that you will be proud to own and will, we are sure, find it an excellent table for your "second" examination room.

This sturdily constructed table is made of the finest genuine Canadian Birch—solid wood legs and rails with birch-face five-ply panels for drawer and door fronts. It is offered in one standard finish only—natural wood in a golden blond color. It has six drawers and one compartment accessible from either side. There is a three position headrest, sliding stirrups, sliding leg rest and foot step. Upholstered with brown DuPont Fabrilite with 2" of padding.

DIMENSIONS:
Length 48", fully extended 68", width 22" height 32".

MM-359a

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1400 Harmon Place, Minneapolis 3, Minnesota

EDWARD A. MEYERDING

(Continued from Page 296)

attended Harvard Graduate School and took special training in Chicago, Boston, and Paris.

In 1917, he served with the United States Army in World War I, and later was promoted to the rank of Colonel in the United States Army Medical Corps.

A member of Ramsey County Medical Society, the Minnesota State Medical Association and the American Medical Association, Dr. Meyerding was an organizer of the Minnesota Trudeau Society. He was also a fellow of the American College of Chest Physicians.

He is survived by his wife, Eugenie; two sons, Dr. E. V. of Medford, Oregon, and Charles of St. Louis, Missouri; a daughter, Mrs. Robert Linsmayer of St. Paul; and a brother, Dr. Henry Meyerding, of Rochester. There are eight grandchildren.

EDWARD B. TUOHY

Dr. Edward B. Tuohy was born in Duluth, March 17, 1908. He was the son of Dr. Edward L. Tuohy, who has been prominent in medical circles as a physician in his home in Duluth and the state of Minnesota. He died in California on January 12, 1959, at the age of fifty-one years.

Dr. Tuohy attended the University of Minnesota, where he received his Bachelor of Science degree in 1929. He entered the University of Pennsylvania, receiving the degree of Doctor of Medicine in 1932. He served his internship in New York City and at the Ancker Hospital in St. Paul.

On October 1, 1933, Dr. Tuohy went to Rochester, where he was a fellow in medicine of the Mayo Foundation, but in 1935 he transferred his major interest to anesthesiology. In 1935, he was appointed first assistant in anesthesiology, and in October, 1935, he was appointed to the staff of the Mayo Clinic as a consultant in that specialty. He received the degree of Master of Science in anesthesiology from the University of Minnesota in 1936, and was certified as a specialist by the American Board of Anesthesiology in 1939. In 1937, he was appointed an instructor in anesthesiology in the Mayo Foundation; in 1940, he was promoted to assistant professor, and in 1945 to associate professor.

In 1942, he left Rochester for active service in the United States Army Medical Corps, and was stationed at the Walter Reed General Hospital in Washington, D. C., and the Percy Jones General Hospital in Battle Creek, Michigan. He was released to civilian status in 1945 with the grade of Major, and was promoted to the position and grade of Lieutenant Colonel in the reserve corps in 1954.

He returned to Rochester in 1945, resuming his post in the Section of Anesthesiology at the Clinic. He resigned in 1947 to enter private practice in Washington, D. C., where he became professor of anesthesiology at Georgetown University Medical School. In 1951, he moved to Los Angeles to enter the private practice of anesthesiology, and since that time received the appointment of professor of surgery in anesthesiology in the

University of Southern California School of Medicine in 1953. He was a consultant to the United States Naval Medical Center, the United States Public Health Service, and senior consultant to the United States Air Force.

Among the distinctions in his field, he was president of the American Society of Anesthesiólogy in 1947, a member of the Board of Directors of the American Board in 1950-1956, and a delegate from that Board to the House of Delegates of the American Medical Association from 1951-1955. He was also a member of the American Society for Experimental Pharmacology and Therapeutics, the American Association for the Advancement of Science, and the Alumni Association of the Mayo Foundation.

He contributed more than a hundred papers to the medical literature on the specialty he followed.

He is survived by his wife, Dorothy, and three children, Barbara, Michael and Patrick, all of Minneapolis.

LEAFLETS ON PREVENTION OF BLINDNESS REVISED

The Prevention of Blindness Department of the Philadelphia Association for the Blind, Inc., has announced the revision and republication of three of its most popular leaflets: "Why Glasses," "Danger Ahead—Glaucoma," and "Check Your Child's Eyes."

The revision was accomplished by the Health Information and Advisory Committee of the Prevention of Blindness Department. This Committee is composed of representatives from City Health and Safety Agencies; Eye Doctors; Public Relations Agencies; Industry and Public Welfare groups. The Committee meets monthly to consider and advise on all programs sponsored by the Prevention of Blindness Department and periodically reviews the effectiveness of all printed material. Results of a previous survey had indicated that the original three mentioned leaflets could be improved in the interests of getting the message over to the reading public in a more concise and effective manner. The three revised leaflets are now available.

The Association has a series of fourteen leaflets on various subjects of eye care and prevention of blindness. Anyone interested in obtaining free samples of these leaflets, may do so by writing directly to the Philadelphia Association for the Blind, Inc., 100 E. Price St., Attention: Prevention of Blindness Department, Philadelphia, Pennsylvania.

MOTION PICTURE REVIEW BOOKLET AVAILABLE

The tenth annual publication of "Reviews of Medical Motion Pictures" is now available from the Film Library of the AMA. This publication is prepared by the Division of Communications, Department of Medical Motion Pictures and Television, and contains reprints of all reviews published in *The Journal AMA* during 1958.



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The Physician's Diary

Dr. John Allen, of Montevideo, has been elected Health Officer for that community.

* * *

The January 1 resignation of **Dr. Grier F. Starr,** a member of the Mayo Clinic staff, has been announced. A member of the Section of Surgical Pathology since 1956, Dr. Starr will be in private practice in Eugene, Oregon.

* * *

A recent speaker at a joint meeting of the Viola and Haverhill Farm Bureau units was **Dr. Lloyd T. Wood,** a member of the Olmsted Medical Group. Dr. Wood discussed the safe use of Herbicides and Insecticides for farm use.

* * *

The new president of the Franklin Hospital Board of Trustees of Minneapolis, is **Dr. A. H. McFarland. Dr. Wayne S. Hagen** has been named vice president.

* * *

The new president of the Twin Cities Diabetes Association is **Dr. Wyman E. Jacobson** of St. Louis Park. Other members of the Minnesota State Medical Association who were elected to office in the Diabetes Association include: **Dr. Philip Soucheray,** St. Paul, first vice president; **Dr. Moses Barron,** Minneapolis, director; **Dr. Karl Anderson,** Minneapolis, director; **Dr. Francis B. Tiffany,** St. Paul, director; and **Dr. Frederick C. Goetz,** Minneapolis, director.

* * *

Dr. Henry W. Blackburn, St. Paul, has been appointed medical director of the Mutual Service Life Insurance Company. He succeeds **Dr. Frank R. Hirshfield** who died in December, 1958.



"I SUPPOSE I COULD DO WITHOUT BREAD--- BUT THEN WHAT'S GOING TO HOLD MY BUTTER?"

* * *

The following physicians and dental surgeons were named to the medical staff of Community Memorial Hospital in Cloquet at the regular January meeting of that group. Medical staff appointments included: **Jack E. Tomhave, D.D.S.,** Cloquet; **R. T. Seashore, M.D.,** Duluth; **Frank N. Knapp, M.D.,** Duluth; **Harold J. Walder, M.D.,** Duluth; **Anthony J. Spang, M.D.,** Duluth; and **Charles A. Linke, M.D.,** Duluth. New members were welcomed during the course of the January meeting by **Dr. R. H. Puumala,** Chief of Staff.

* * *

Guest speaker of the winter meeting of the Mount Sinai Hospital Women's Auxiliary held recently at Israel Temple in Minneapolis was **Dr. E. H. Rynearson** of the Mayo Clinic. His subject was "Women Are Never Neurotic."

* * *

Physicians of the East Range Clinic at a recent organization meeting approved the formation of a new medical research organization, the East Range Clinic Foundation. Members elected were **Drs. M. T. Summar,** president; **J. R. Chittum,** first vice president; **L. K. McGill,** second vice president; **M. J. Weir,** secretary; **R. W. Anderson,** treasurer.

* * *

Dr. Malcolm A. Campbell and **Dr. John R. Watson,** of the Olmsted Medical Group, appeared on a recent program of the Rochester Hi-Y club, sponsored by the Rochester YMCA. Dr. Campbell showed slides of Japan and Dr. Watson discussed careers in medicine.

* * *

New officers were installed recently at the annual meeting of the St. Barnabas Hospital medical staff, Minneapolis. Elected chief of staff by the more than 150 members was **Dr. R. G. Pinkham,** a general practitioner. Outgoing chief, **Dr. Edgar A. Webb,** automatically became counsellor to the staff. Others elected were **Drs. M. T. Mitchell,** vice chief of staff; **D. G. Bohn,** re-elected as secretary-treasurer. The following were elected chiefs of sections: **Dr. Paul Bilka,** medicine; **Dr. U. S. Anderson,** general surgery; **Dr. John T. Moehn,** obstetrics and gynecology; **Dr. A. V. Stoesser,** pediatrics, and **Dr. Archie Smith,** general practice.

* * *

Dr. J. S. Blumenthal, Director of Allergy at the University of Minnesota, gave an address to the hospital pharmacists of the Twin Cities on January 28, 1959, in Minneapolis. His subject was "Concepts of Allergy Treatment."

* * *

Dr. Donald C. Balfour, of Rochester, was awarded an honorary fellowship in the Royal College of Physi-

(Continued on Page 304)

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(Continued from Page 302)

cians and Surgeons of Canada in absentia at the convocation of the college in Vancouver recently.

* * *

Dr. Charles W. Mayo, Rochester, has been named chairman of the 1959 Minnesota Easter Seal Appeal. The announcement was recently made by Rustan O. Thayer, president of the Minnesota Society for Crippled Adults and Children.

* * *

The new elected president of the medical staff of St. Gabriel's Hospital in Little Falls is **Dr. Owen Bolstad.** Other officers chosen at the regular monthly dinner meeting of the group held in January included: **Dr. C. J. Dillenburg,** vice president; **Dr. Royden Belcher,** secretary-treasurer; and as members of the Executive Committee, **Drs. M. L. Hansen, S. W. Watson** and **R. J. Stein.**

* * *

New medical staff officers of St. Luke's Hospital, St. Paul, were installed at the staff's recent annual dinner-dance held in the Minnesota Club. Officers for 1959 include **Dr. C. T. Eginton,** chief of staff; **Dr. C. W. Leverenz,** vice chief; **Dr. M. B. Sorem,** secretary, and **Dr. R. E. Lindell,** member-at-large. Chiefs of service are: **Dr. Donald D. Deters,** general practice; **Dr. D. E. Westover,** surgery; **Dr. C. W. Froats,** obstetrics, and **Dr. Donald DeRauf,** medicine.

* * *

The newly elected chief of staff of Doctor's Memorial Hospital, Minneapolis, is **Dr. George D. Eitel.** Other officers include **Dr. Arthur Ide, Jr.,** vice chief of staff, and **Dr. Richard Anonsen,** secretary-treasurer.

* * *

Members of the Mayo Clinic staff who recently participated in medical conferences, meetings and institutes throughout the United States include the following: **Dr. H. F. Polley** presided at an afternoon session of the Institute of Steroid Therapy held January 8, in Columbus, Ohio, and as moderator of a panel discussion of "Practical Problems of Steroid Therapy." Assisting with the examinations of the American Board of Surgery, January 12 and 13, in Houston, Texas, was **Dr. J. M. Waugh,** who also presented the Urban Maes Lecture, January 14, at Tulane University, New Orleans, Louisiana. His subject was "Fundamentals in the Management of Carcinoma of the Colon and Rectum." **Dr. K. M. Simonton** presented a paper, written with **Dr. L. D. Hedgecock,** titled "Two Frequency Auditory Screening, Clinical Evaluation" at the Triological Society's middle section meeting January 12 and 13, in St. Louis. **Dr. J. Grafton Love,** vice president, presided at a meeting of the Minnesota Society of Neurology and Psychiatry, January 13, in St. Paul. Conducting a clinic in Neuro-ophthalmology at the meeting of the Kansas City (Missouri) Opthalmalogical Society was **Dr. C. W. Rucker.** He also presented two papers. **Dr. R. D. Pruitt** assisted with examinations for the subspecialty of cardiovascular disease of the Ameri-

(Continued on Page 306)

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can Board of Internal Medicine in Atlanta, Georgia, January 16 and 17.

* * *

Ellendale physician, **Dr. Morton Roan,** has announced that because of the serious illness of his wife, it will be necessary for him to continue his practice on a limited basis temporarily.

* * *

"Man Against Himself" was the subject of an address given by **Dr. Dale C. Cameron,** director of medical sciences, Minnesota Department of Public Welfare, at a meeting of the American Association of University Women held in St. Paul.

* * *

Dr. P. A. Lommen, an active member of the Austin Public School Board of Directors for seventeen years, was recently awarded the Fifteenth Annual MEA distinguished service school board award.

* * *

Minnesotans attended meetings of the Board of Directors of the Sister Elizabeth Kenny Foundation held in Los Angeles included the following Minnesota State Medical Association members: **Dr. Frank H. Krusen,** Rochester; **Dr. Wallace Cole,** St. Paul; **Dr. Frederic J. Kottke,** University of Minnesota; **Dr. F. J. Huenekens,** Minneapolis; **Dr. Miland E. Knapp,** Minneapolis, and **Dr. Paul M. Ellwood, Jr.,** Minneapolis.

* * *

Dr. Frank Kiesler was a recent speaker at a mental health study program arranged by the College of St. Catherine Department of Nursing. Dr. Kiesler, director of training in psychiatry at the University of Minnesota, reported on integration in the basic curriculum of medical education.



"SOMEONE WANTS A DOCTOR!"

Book Reviews

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

VIRAL AND RICKETTSIAL INFECTIONS OF MAN. Third Edition. Edited by Thomas M. Rivers, M.D. Member Emeritus, Rockefeller Institute, Vice President Medical Affairs, The National Foundation; and Frank L. Horsfall, Jr., M.D., Vice President for Clinical Studies, Physician-in-Chief to the Hospital, The Rockefeller Institute. 967 pages. Illus. Price $8.50, cloth. Philadelphia: J. B. Lippincott Co., 1959.

PHYSICAL DIAGNOSIS—The History and Examination of the Patient. John A. Prior, M.D., Professor of Medicine, Ohio State University, College of Medicine, Columbus; and Jack S. Silberstein, M.D., Clinical Associate Professor of Medicine, Ohio State University, College of Medicine, Columbus. 388 pages. Illus. Price $7.50, cloth. St. Louis: C. V. Mosby Co., 1959.

THE PLASMA PROTEINS. Paul G. Weil, B.A., M.D.C.M., M.Sc., Ph.D. Director of Transfusion Service and Assistant Physician, Royal Victoria Hospital; Lecturer in Medicine, McGill University; Consultant in Medicine, Queen Mary Veterans and Grace Dart Hospitals; Consultant in Transfusion, Queen Elizabeth and Royal Edward Laurentian Hospitals. 133 pages. Illus. Price $3.50, cloth. Philadelphia: J. B. Lippincott Co., 1959.

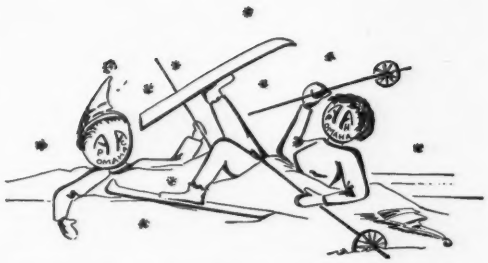
TUMORS OF THE LUNGS AND MEDIASTINUM. B. M. Fried, M.D., F.C.C.P. Associate Attending Physician, Montefiore Hospital; Associate Visiting Physician, Morrisania City Hospital, New York. 467 pages. Illus. Price $13.50, cloth. Philadelphia: Lea & Febiger, 1959.

MEDICAL DEPARTMENT, U. S. ARMY, IN WORLD WAR II. Volume IV. Communicable Diseases Transmitted Chiefly Through Respiratory and Alimentary Tracts. Edited by Ebbe Curtis Hoff, M.D. Written by twenty-one medical authorities. 544 pages. Illus. Price $5.50, cloth. Washington, D. C.: Office of the Surgeon General, U. S. Government Printing Office, 1958.

CLINICAL OBSTETRICS AND GYNECOLOGY. Vol. 1, No. 4. Symposium on Operative Obstetrics. Edited by J. Robert Willson, M.D. Symposium on Genital Cancer. Edited by Daniel G. Morton, M.D. Illus. Price, $18.00 for series of four volumes, cloth. New York: Paul B. Hoeber, Inc., 1959.

THE INCURABLE WOUND and Further Narratives of Medical Detection. By Berton Roueche. 178 pages. Price $3.50. Boston: Little Brown and Co., 1958.

In six non-sterotyped stories, the author has presented in concise but fascinating detail, the necessary facts of different illnesses and the medical progress thereon. The information contained is of interest to the physician and the laity, especially parents.



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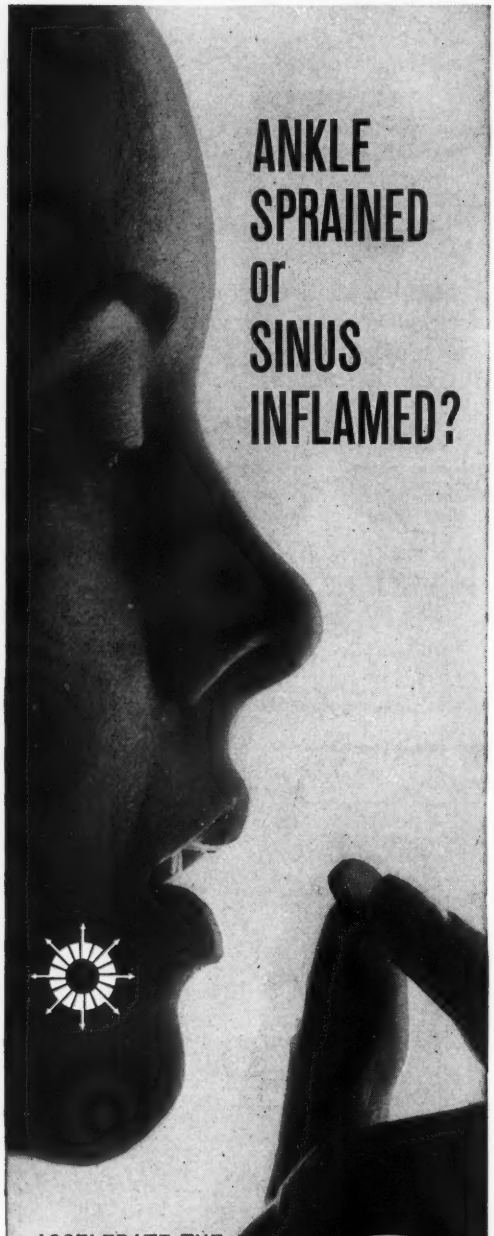
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The book is satisfactorily bound on non-glare paper with well-spaced and legible large print.

Perhaps more highly priced than the usual short-story book under 200 pages, this work is a good addition to most public or private libraries.

J. T. GRISMER, M.D.

LESIONS OF THE LOWER BOWEL. By Raymond J. Jackman, M.D., M.S. in Proctology, Head of the Section of Proctology, Mayo Foundation, Graduate School, University of Minnesota, Rochester, Minnesota. 347 pages. Illus. Price $15.50. Springfield, Illinois: Charles C Thomas, 1958.

This book presents, for the first time in words and color photographs, a rather complete story of the common and uncommon lesions of the lower bowel. Although the major emphasis is on diagnosis, there is enough ancillary information to give the reader a fairly comprehensive picture of this field of medicine. Written by a clinician of long experience and excellent judgment, the book is a succinct and honest appraisal of the subject. In an era when proctosigmoidoscopy is assuming its proper role as a diagnostic aid, this volume can be recommended to all physicians. Every chapter is loaded with nuggets of important clinical data that few physicians would be able to glean for themselves.

It is difficult for this reviewer to single out certain chapters for special comment. The chapter on the Technic of Proctoscopy, however, could be called one of the highlights of the book. The Color Atlas which contains a rare and beautiful collection of clinical photographs is outstanding and should be studied by the student and clinician alike.

As a fellow proctologist, this reviewer wishes to thank Dr. Jackman for this meritorious contribution to proctologic literature. This book can be recommended highly to all physicians and students interested in intestinal diseases.

WILLIAM C. BERNSTEIN, M.D.

AMID MASTERS OF TWENTIETH CENTURY MEDICINE; A PANORAMA OF PERSONS AND PICTURES. By Leonard G. Rowntree, M.D. 684 pages. Illus. Price, $11.50. Springfield, Illinois: Charles C Thomas, 1958.

This is an excellent résumé of Dr. Rowntree's experience during his active years in medicine. It is particularly interesting to physicians in Minnesota because of the large amount of space devoted to the time he spent both as Professor of Medicine at the University of Minnesota and Chief of the Division of Medicine at Mayo Clinic.

Dr. Rowntree exemplifies the truly great physicians

whose knowledge was not limited to medicine alone but enveloped all of the allied fields as well as the humanities.

The book is well illustrated, the paper is excellent, and the printing of the usual high quality one expects from the Thomas publishers.

This book makes pleasant reading and relates many interesting and personal anecdotes concerning the great of this century.

JOHN F. BRIGGS, M.D.

CLINICAL OBSTETRICS AND GYNECOLOGY. Quarterly book series, Vol 1, No. 1, March, 1958. Guest Editors: Curtis J. Lund, M.D., Professor of Obstetrics and Gynecology, University of Rochester School of Medicine, and Allan C. Barnes, Professor of Obstetrics and Gynecology, Western Reserve University School of Medicine. Foreword by each editor. 288 pages. Illus. Price $18.00 for four consecutive issues. Cloth. New York: Paul B. Hoeber, Inc., Medical Book Department of Harper and Brothers, 1958.

From the publisher's note and outline of future guest editors and topics, this quarterly will have a symposium on a gynecological subject and one on an obstetric topic each issue. Each will be headed by a guest editor who is outstanding in his specialty and noted for original work and teaching on the subject. Contributors have been asked to describe management details of a specific clinical problem.

Ten papers are presented under the heading of Medical Problems of Pregnancy and eleven titles are considered in the symposium for Management of Endocrine Problems. Contributors to the first issue, for the most part, are recognized authorities of the subject matter presented.

Some controversial topics are presented, and it is stimulating and refreshing to have other view points presented. However, this reviewer must side with one of the guest editors and not agree with all details presented.

The apparent purpose of this publication is neither to duplicate available journals nor to report original work, but rather to outline a practical clinical application for case management. Obviously, many biblographies are limited but do certain necessary references to original papers. A cumulative index is slated to appear in each issue and this quarterly could soon become a handy and up-to-date reference.

Addition of this quarterly solely dedicated to clinical obstetrics and gynecology in practice will be welcomed by the specialist, generalist, and medical student.—JAY R. OLSEN, M.D.

THE FAMILY MEDICAL ENCYCLOPEDIA. Justus J. Schifferes, Ph.D., Director, Health Foundation Council. Formerly Medical Editor, National Foundation for Infantile Paralysis; Associate in Hygiene, Columbia University; Managing Editor, *Modern Medicine*. 617 pages. Illus. Price, $4.95, cloth.

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the Health Education Council and author of such books as Healthier Living, How to Live Longer and Science Through the Ages, is purportedly the first book to really meet this need. An ABC of up-to-date medicine, it is three books in one: an authoritative health encyclopedia, an illustrated medical dictionary and a manual of first aid.

The Family Medical Encyclopedia answers the most common and pressing questions about hospitals, modern medicine, health and disease. It is written in words which are easy to understand. The subjects are arranged from A to Z, as in a dictionary, including lucid definitions of those medical terms most frequently used by physicians and nurses when talking to you or your family. In addition, there are comprehensive articles on the most common diseases: arthritis, cancer, diabetes, heart trouble, and many others; on the care and functioning of your body; on preparing yourself to go to the hospital; on health in childhood and old age. Such entries as Health Insurance and Blue Cross cover the economic aspects of medical and hospital care, and the sequence of topics of diet, the digestive system, fat, vitamins and weight — including a separate calorie counter—are particularly helpful.

Although all the information in The Family Medical Encyclopedia has been checked and rechecked by a board of eminent physicians, this book is not intended to replace the family doctor. It tells when a person should go to his physician, and it answers many of the questions that the patient doesn't quite get around to asking his physician. Its common sense information will make medical emergencies less likely. Furthermore, it stresses attitudes towards health, disease, and disabilities which consider psychological as well as physical health.

This is a book to be kept close at hand for quick reference. It is also a fascinating book to browse in, leading the reader to a greater knowledge of medicine today. A completely new and up-to-the-minute work, written in terms that the layman may understand, The Family Medical Encyclopedia is a complete guide to health and medical care for the entire family.

SEA GULLS AND DIURESIS

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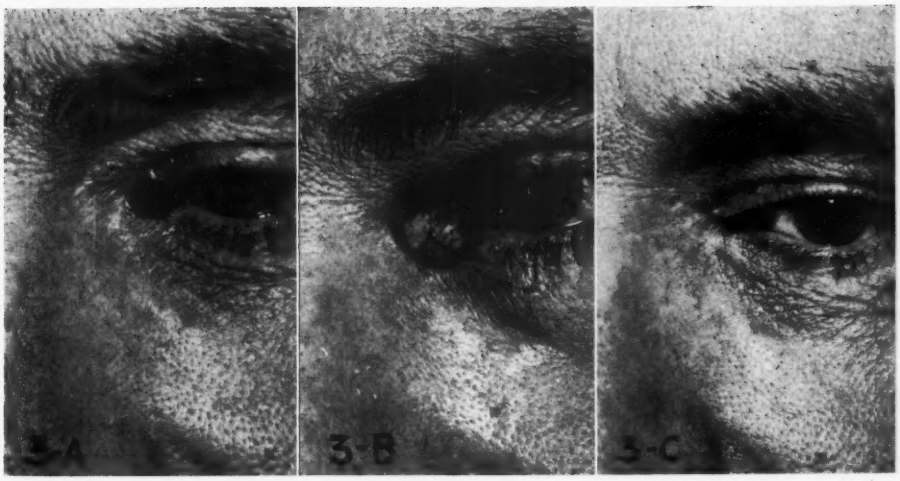


Fig. 3. (A) Basal cell carcinoma which had not responded to radium and roentgen ray therapy over a period of three years. (B) Granulation tissue after chemosurgical excision of the highly invasive, keratinizing basal cell carcinoma. (C) Healed lesion. There was no recurrence after six years.

Chemosurgical Treatment of Cancer at the Facial Orifices

FREDERIC E. MOHS, M.D.

Madison, Wisconsin

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ALTHOUGH most external forms of cancer frequently send out "silent" extensions into the surrounding tissues, these unpredictable outgrowths are particularly prone to occur in cancers at the facial orifices, namely those of the nose, ears, eyelids, and lips. Since the chemosurgical method, with its complete microscopic control of excision, makes it possible to follow out and destroy these silent outgrowths in a selective manner, the technique results not only in unprecedented assurance of complete removal but also in the preservation of maximal amounts of normal tissues.[1]

Complete microscopic control of excision is accomplished by the systematic use of frozen sections. In order to obtain intact and form-retaining specimens from the entire area under suspicion, it is necessary to produce fixation *in situ* by means of a fixative chemical such as zinc chloride. This chemical, a caustic long used to destroy diseased tissue, was selected after the trial of many fixatives because (1) it is non-toxic systemically in the amounts ordinarily used, (2) it produces adequate fixation with preservation of the microscopic features of the tissues, (3) it has

Presented at the Symposium on Skin Cancer for Dermatologists, University of Minnesota Continuation Center, Minneapolis, October 26, 1957.

no odor, (4) it is safe to handle since it does not readily penetrate the intact skin, (5) it does not damage the healing qualities of the tissues just beyond the limit of fixation, (6) it penetrates well through the tissues and (7) its penetration is accurately controllable when it is incorporated in a paste vehicle of proper design.

The vehicle is composed mainly of a finely granular form of stibnite which is an ore of antimony. A small amount of Sanguinaria canadensis is used as a binder. A satisfactory formula is as follows: stibnite (80 mesh sieve), 40 gm.; Sanguinaria canadensis, 10 gm.; and zinc chloride, saturated solution, 34.5 cc. By varying the depth of application of this paste and the time of its action, the depth of fixation can be accurately varied from a fraction of a millimeter to a centimeter or more.

To determine whether fixative chemicals have any tendency to increase the incidence of metastasis, a group of 114 rats bearing Flexner-Jobling carcinoma was divided into treated and control groups. Repeated, subcurative applications of the zinc chloride fixative were used over a long time in a deliberate attempt to increase metastasis. Instead of an increase, however, there actually was a decrease in the incidence of metastasis to the lymph nodes and lungs from a rate of 41.5 per cent in the control group to a rate of 28 per cent in the treated group. The conclusion that chemical fixation has no tendency to cause cancer to spread has been confirmed by clinical experience in the chemosurgical treatment of nearly 6,000 patients with cancer during the past twenty-one years.

Technique

The chemosurgical technique by which cancer may be excised under complete microscopic control is illustrated by the following report of a case of squamous cell carcinoma of the ear. The neoplasm had grown rapidly to form a large, ulcerated, infiltrative mass which was fixed to the aural cartilages (Fig. 1A).

Local anesthesia was produced by the injection of a 1.5 per cent solution of procaine into the tissues surrounding the neoplasm. Care was used to inject at a sufficient distance from the cancer to be sure that the needle passed through no part of the neoplasm. Then the grossly visible portion of the mass was excised with a scalpel. The cancer tissue was observed to extend to the cartilage and to perforate it in a small area. Hemostasis was secured by the application of dichloracetic acid which also was applied to the skin at the periphery in order to render the stratum corneum permeable to the zinc chloride. A frozen section revealed squamous cell carcinoma, grade 2. The zinc chloride fixative was applied in a depth of about 1 mm. at the periphery and about 0.5 mm. in the center of the lesion. Dressings of cotton and vaselinespread cotton were applied (Fig. 1B). Codeine and aspirin were prescribed as needed for analgesia.

On the next day, a layer of fixed tissue 1 to 2 mm. thick was excised from the entire periphery and from the tissues at the base of the perforation through the cartilage. The area over the rest of the exposed cartilage did not require sectioning because the cartilage was not eroded at any other point. There was no pain or bleeding from the excision of this layer since the incisions were made through fixed tissue. The origin of each specimen was indicated on a map of the lesion on a pad of paper (Fig. 2A) and also by marking on the lesion with mercurochrome (Fig. 1C).

Frozen sections were made through the undersurface of each flat specimen. Less than an hour after the specimens had been removed, the sections were scanned under the microscope by the operator and the areas of cancer were marked on the map (Fig. 2A). Reapplication of the fixative was limited to the areas in which cancer was demonstrated microscopically (Fig. 1C).

On the following day, specimens were removed from the two treated areas and frozen sections were made. Microscopic examination revealed no cancer. The lesion was covered with a dry dressing.

Five days later the final layer of fixed tissue was sufficiently demarcated to permit removal revealing well vascularized granulation tissue (Fig. 1D). The lesion epithelized rapidly (Fig. 1E). There was no recurrence after five years and no metastases developed.

Indications

Although the chemosurgical method may be used to remove most external cancers and many of those in cavities sufficiently accessible to permit the stage-by-stage procedure, the present communication is limited to those around the facial orifices, namely, those of the ear, eyelids, nose, and lips.

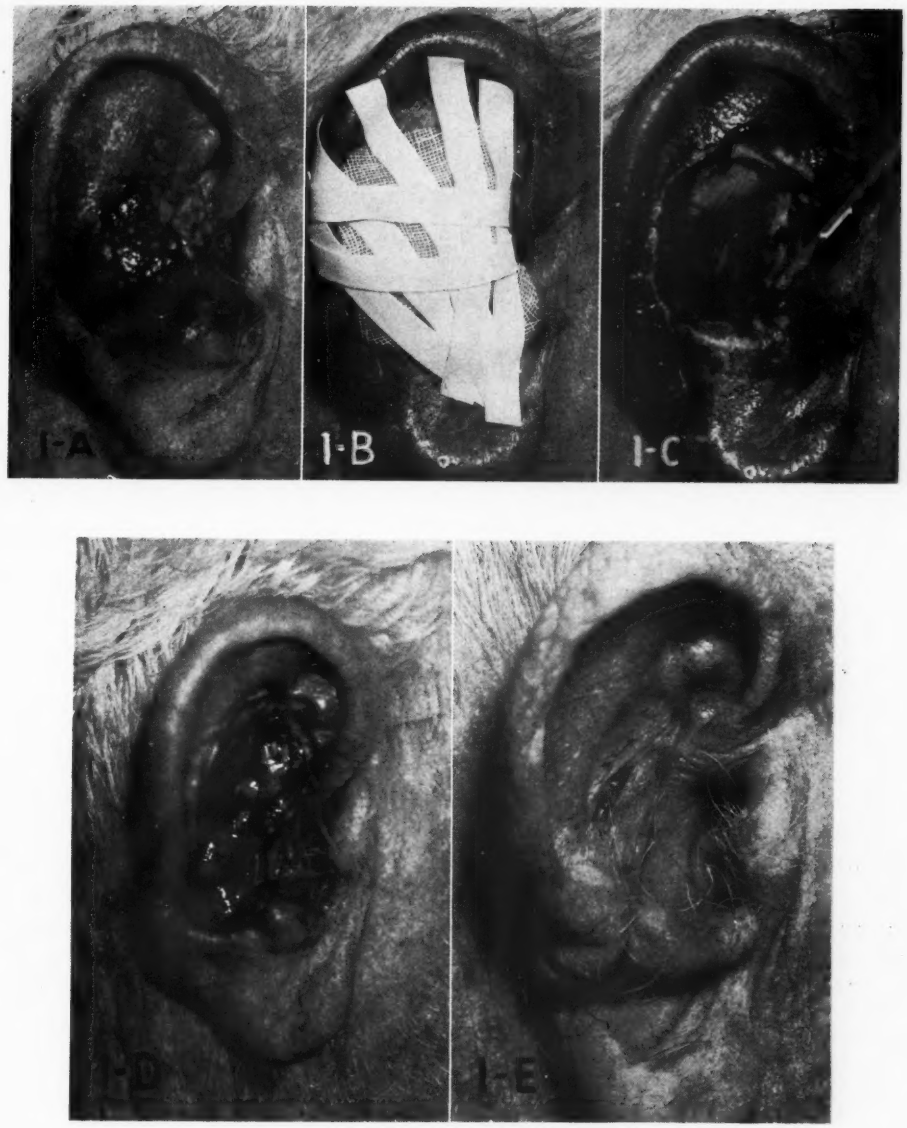


Fig. 1. (A) Squamous cell carcinoma which was adherent to the underlying cartilage. (B) Dressing to hold fixative in place. The main mass had been excised surgically, hemostasis secured with dichloracetic acid and the zinc chloride fixative paste applied. (C) Lesion on the second day. A layer of fixed tissue had just been excised and systematically studied under the microscope by means of frozen sections. The reapplication of the black fixative paste is being limited to the two areas of microscopically-located cancer (Fig. 2A). On the next excision these two areas were microscopically cancer-free (Fig. 2B). (D) Granulation tissue after separation of final layer of fixed tissue. (E) Healed lesion. The patient declined the removal of a small wedge of tissue which was suggested for correction of the irregularity in the outline of the helix. There was no recurrence after five years.

Cancer of the Ear.[2]—As illustrated in Figures 1 and 2, the microscopic control afforded by the chemosurgical method permits sure removal of cancers of the ear and at the same time permits the preservation of maximal amounts of uninvolved tissue. Hence, even though the cancer was fairly extensive, most of the ear was saved.

The removal of carcinomas which deeply invade the helix may result in a sharply-punched-out niche. However, the appearance often can be much improved either by the removal of some of the adjacent tissue to produce a smooth contour or by the removal of a wedge so the defect can be closed. The actual extent of lesions arising on the posterior surface, in the postauricular sulcus, or on the adjacent scalp may be quite unpredictable clinically. Thus, the microscopically guided excisions often reveal silent outgrowths of considerable extent in the surrounding tissues. As in other parts of the ear, the cancer often invades to the level of the cartilage and then extends peripherally on the perichondrium. However, even if quite extensive, lesions in this area usually heal with little visible defect.

Cancers extending inwardly along the external auditory canal are somewhat more difficult to remove chemosurgically because of the small size of the opening. However, by the use of slender instruments the neoplasm can be followed out chemosurgically even though it extends to the middle ear.

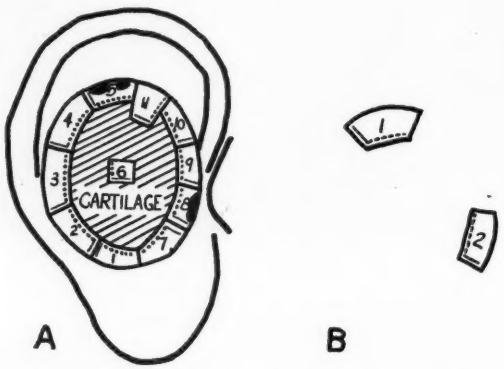


Fig. 2. (A) Map showing origin of the specimens into which the first layer of fixed tissue had been divided. The two solid black areas are the foci of remaining cancer as visualized in the frozen sections. (B) Map of the lesions on the next day. No cancer was found in these specimens.

Cancer of the Eyelids.[3]—A common neoplasm of the eyelids is basal cell carcinoma of the inner canthus (Fig. 3A). Often these send extensions along the periosteum of the medial wall of the orbit or into the adjacent eyelids, but usually the eyeball is not invaded until late. Hence, the chemosurgical removal even of rather advanced neoplasms in this area usually can be accomplished without damage to the bulbus.

In the treatment of eyelid cancer, care must be used to keep the fixative chemical out of the eye. Ordinarily, the grossly visible portion of the neoplasm is removed surgically, the tissues having been anesthetized with procaine. This results in a saucerized depression in which the fixative can be spread and an occlusive dressing applied. The chemosurgical excisions are carried out until they can be carried no further without getting the fixative in the eye. Subsequent layers then are excised surgically and frozen sections made to determine when treatment is complete. The use of unfixed surgical specimens in this manner is feasible when the area being investigated is small,

but it is not practical when larger areas are affected because the unfixed tissues do not retain their shape and they are more difficult to section. After the removal of surgical specimens, the area is cauterized with dichloracetic acid to stop bleeding and to prevent spreading of cancer cells to other parts of the wound.

Cancer of the lower eyelid is treated in much the same way. When the lid margin is affected or closely approached during removal of a cancer it is advisable to remove the full thickness of the eyelid in that area. This produces a niche, but this fills in and the eyelid pulls up into normal position in a remarkable manner. Care must be exercised to avoid leaving excessive conjunctiva at the lid margin because the scar may pull this membrane forward producing an ectropion. When the cancer is several millimeters from the lid margin, however, the elastic eyelid tissues readily stretch so that the contraction of the scar does not produce ectropion.

Cancer of the upper eyelid usually arises well above the lid margin and is relatively easy to treat chemosurgically. If such a cancer invades through the full thickness of the eyelid there is virtually no danger of damage to the eyeball during treatment because the tears dilute the fixative chemical and prevent the formation of harmful concentrations. Of course, if the cancer is so extensive that the removal of the entire upper eyelid is necessary, the excessive exposure of the eyeball may require closure by suturing the lower eyelid to the stump of the upper lid. Lesions at the margin of the upper lid are treated in the same manner as those on the lower lid.

Cancers at the outer canthal region do not have as much room between the rim of the orbit and the eyeball as those at the inner canthus. Hence, as the outer canthal neoplasm becomes more extensive the eyeball becomes correspondingly more vulnerable to invasion. However, unless the sclera is actually invaded by the cancer, the eye usually can be saved by careful chemosurgical excision. In cases in which the eyeball is hopelessly invaded or surrounded by the cancer, the bulbus is removed under local anesthesia and chemosurgical treatment is continued as necessary.

Cancer of the Nose.[4]—Because many cancers of the nose are rather invasive and often send out extensions which are difficult to feel because their consistency closely resembles that of the fibrocartilaginous tissues of the nose, the microscopic guidance provided by the chemosurgical technique is of particular value. Lesions of the alae and nasolabial fold are especially unpredictable (Fig. 4). Alar lesions of moderate extent can be removed with little defect. Those invading the full thickness necessitate the formation of a niche or perforation, but since maximal amounts of well vascularized tissues are preserved, the repair of these defects with composite grafts from the ear is almost always successful.

Advanced lesions may send out extensions for long distances along such structures as the perichondrium, periosteum and embryologic fusion planes. The selective removal of all of these unpredictable extensions may be somewhat laborius, but in such cases it may be the only way to eradicate the cancer. The conservatism which permits preservation of adjacent tissues and structures such as the eyes often is an additional important advantage.

Cancer of the Lip.[5]—Whether of the lower, upper or commissural areas, squamous cell carcinoma of the lips may be reliably and yet conservatively removed by the chemosurgical technique (Fig. 5). Though there frequently are silent extensions of cancer, which may be located unpredictably either in the central or in the peripheral parts of the lesion, the majority of these cancers can be removed so conservatively that little visible scar or defect is produced. Even when the cancer is so extensive that insufficient lip tissue is left for good function, the preservation of appreciable amounts of well vascularized tissue makes it relatively easy to carry out a satisfactory plastic repair. Of course, when metastases are present or suspected, a surgical neck dissection is indicated.

Discussion

The chief advantage of the chemosurgical method in the treatment of external cancer is the unprecedented reliability which results from the microscopic control of excision. Thus, in a consecutive series of 2,019 cases of basal cell carcinoma of the skin the five-year rate of cure was 98.6 per cent, while in a series of 869 cases of squamous cell carcinoma of the skin the rate of cure was 87.8 per cent. Adding both groups together there were 2,888 cases of skin cancer with a five-year rate of cure of 95.5 per cent. The next

best rate of cure in the literature for a similar series of cases was 87.6 per cent which was reported from the Radiumhemmet of Stockholm. In both series, approximately a third of the patients had cancers which previously had been unsuccessfully treated by means of some surgical or radiotherapeutic procedure, and many of the cancers were rather advanced. Similarly, in a series of 533 cases of squamous cell carcinoma of the lips, treatment with chemosurgery resulted in a five-year rate of cure of 92.1 per cent which is well above those reported in the literature.

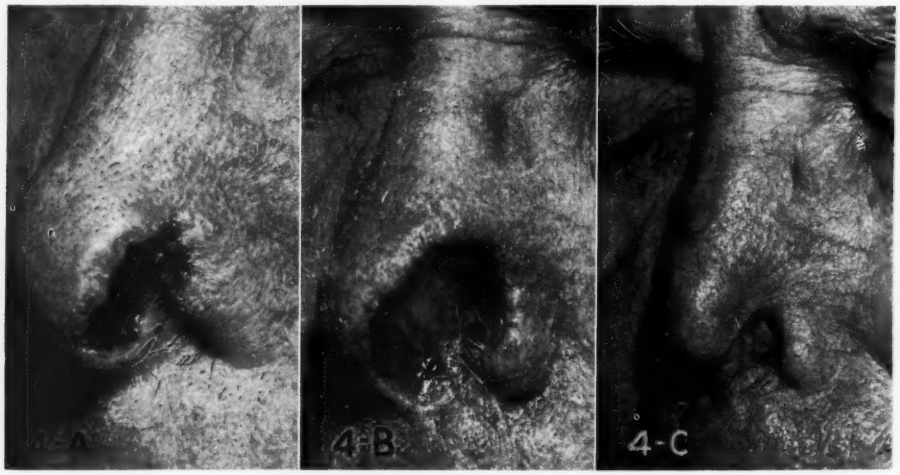


Fig. 4. (A) Basal cell carcinoma which had recurred after eight roentgen and four electrodesiccation treatments. (B) Granulation tissue after chemosurgical excision. (C) Healed lesion. The niche could have been repaired with a composite graft from the ear if the patient had wished it. There was no recurrence after five years.

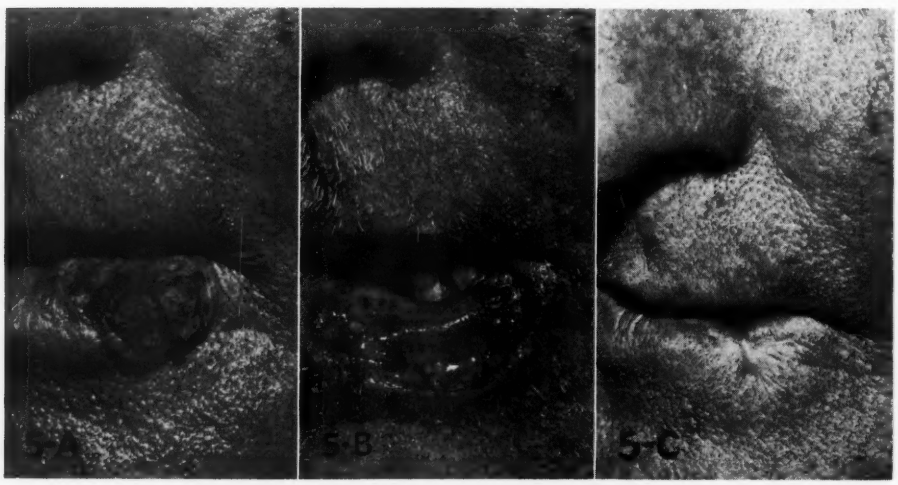


Fig. 5. (A) Squamous cell carcinoma, grade 1, of lower lip. (B) Granulation tissue after chemosurgical excision. Enlarged submaxillary nodes removed in a left suprahyoid neck dissection were reported inflammatory lymphadenopathy. (C) Healed lesion. There was no recurrence after five years.

A second important advantage of the chemosurgical method is the conservatism that can safely be practiced. The microscopic control makes it unnecessary to remove a wide zone of surrounding tissue in order to have reasonable assurance of complete removal. Actually, only 1 or 2 millimeters need be removed beyond the borders of the neoplasm.

Both the reliability and the conservatism are the direct result of the complete microscopic control which makes it possible to follow out the unpredictable extensions of the cancer into the surrounding tissues. In some cases these extensions exhibit a rather selective affinity for certain structures such as the dermis, fascial planes, periosteum, perichondrium, embryologic fusion planes, nerve sheaths, lymph vessels or blood vessels.[6] In other cases there may be no special affinity for particular tissue structures, and yet the cancer may exhibit irregular and unpredictable extensions because of the many variations in the mechanical and nutritive conditions which affect the spread of cancer cells through the tissues. Not infrequently the "silent" outgrowths extend for several centimeters beyond the grossly detectable portion of the mass while lesser degrees of clinically unrecognized peripheral spread occurs in a great majority of cases.

A third advantage of the chemosurgical method is the extremely low operative mortality rate of approximately one-third of one per cent. The lack of need for a general anesthetic and the rarity of infection and other complications are responsible for the safety of the method. This is an important advantage in view of the fact that many patients with cancer are elderly and in fragile health.

A fourth advantage of the chemosurgical method is the fact that the technique permits the extension of operability to a considerable group of patients with cancers too advanced to be amenable to the usual surgical and radiotherapeutic measures.[7]

A fifth advantage is the excellent healing and essential lack of adverse sequelae following chemosurgical treatment. Never does the scar break down or undergo malignant change, and only rarely do keloid scars form.

While the chemosurgical technique is relatively simple in principle, its practice requires special knowledge and special skills which are best attained by special training and which are retained by constant practice. For optimal results, a special clinic with facilities and technical personnel for the preparation of the special type of frozen sections is necessary. Eventually, such a setup should be available in every large center of population.[8]

Summary

The chemosurgical method attains complete microscopic control of the excision of accessible cancer by the systematic use of frozen sections of the tissues which have been chemically fixed *in situ* prior to excision. The microscqpic control is of particular value in the treatment of cancers of the ears, eyelids, nose and lips because in these orificial areas "silent" outgrowths into the surrounding tissues occur especially frequently. Since these unpredictable outgrowths can be excised accurately and selectively, there results an unprecedented assurance of complete removal and yet, only minimal amounts of uninvolved tissues need be removed. Other advantages are the low operative risk, the extension of operability to a considerable number of patients with cancers not amenable to the usual surgical or radiation treatments and the excellent healing with the virtual lack of adverse sequelae. Special facilities and personnel for the use of this method eventually should be available in every large center of population.

References

1. Mohs, F. E.: Chemosurgery in Cancer, Gangrene and Infections. Springfield, Ill.: Charles C Thomas, 1956.
2. Mohs, F. E.: Chemosurgical treatment of cancer of the ear: a microscopically controlled method of excision. Surgery, 21:605, 1947.
3. Mohs, F. E.: Chemosurgical treatment of cancer of the eyelid: a microscopically controlled method of excision. Arch. Ophth. & Syph., 39:43, 1948.
4. Mohs, F. E.: Chemosurgical treatment of cancer of the nose: a microscopically controlled method. Arch. Surg., 53:327, 1946.
5. Mohs, F. E.: Chemosurgical treatment of cancer of the lip: a microscopically controlled method of excision. Arch. Surg., 48:478, 1944.
6. Mohs, F. E., and Lathrop, T .G.: Modes of spread of cancer of the skin. Arch. Dermat. & Syph., 66:427, 1952.
7. Mohs, F. E.: The chemosurgical method for the microscopically controlled excision of radioresistant facial cancer. Am. J. Roentgenol., 73:61, 1955.
8. Mohs, F. E.: Chemosurgical treatment of cancer of the skin: a microscopically controlled method of excision. J.A.M.A., 138:564, 1948.

Diagnosis and Treatment of Epileptic Disorders

● *The distressed epileptic patient and his family frequently come to the general practitioner for solution of the medical and social problems associated with this convulsive disease. This article outlines aids in diagnosis and emphasizes how the physician can aid the patient to live with his disease if it cannot be completely controlled.*

DONALD W. MULDER, M.D.
Rochester, Minnesota

From the Section of Neurology, Mayo Clinic and Mayo Foundation, Rochester, Minnesota.

IN the diagnosis and treatment of neurologic disease, the recognition and proper interpretation of epileptic seizures are frequently of crucial significance. Because of its dramatic character, a generalized convulsion rarely leaves any doubt as to what has occurred. Minor seizures may cause much confusion in diagnosis because of the diversity of their symptoms. Yet any seizure, no matter how seemingly inconsequential, is of great significance as a sign of cerebral disease. It has been customary to regard epilepsy as a disease sui generis. My associates and I[1] have found it more useful to think of convulsions as a symptom.

Seizures are brief and stereotyped cerebral storms inappropriate to the immediate situation and followed by transient impairment of cerebral function.[2] The attacks begin abruptly and irresistibly. They usually are initiated by a warning, or aura, lasting for a few seconds. The patient cannot change the pattern of the attack. The seizure itself is brief, usually lasting less than five minutes and often no more than a few seconds. Attacks may occur repeatedly, giving the impression of a prolonged seizure persisting at times for hours or days; this is called "status epilepticus." In any one patient, the seizures are stereotyped, as already indicated, although slight variation may occur with progression of the cerebral lesion. Finally, inhibition of cerebral function follows the seizure and may persist longer than the attack itself. This paralysis commonly is evidenced by coma or a disturbance of the person's higher faculties, so that his mentation is impaired. A temporary postictal hemiparesis, or Todd's paralysis, may result when a seizure arises in the primary motor areas of the cerebral cortex. This may last only a few minutes, but in rare instances it may persist for two or three days. Persistent postconvulsive cerebral paralysis is frequently indicative of severe organic brain disease.

The evaluation of seizures depends on a satisfactory history. The patient himself often is unaware of the exact evolution of his attacks, or he may be embarrassed by his symptoms and prefer not to discuss them. Therefore, part of the history must be obtained and verified by witnesses to an attack. The attack may so frighten observers that they cannot give a reliable account of it; thus, it is often desirable to summarize the description of several witnesses.

As already noted, a seizure is only a symptom. Therefore, the decision that a patient has a convulsive disorder does not indicate that a diagnosis has been made but rather that the investigation has begun. Since a seizure results from episodic, excessive and disorderly focal neuronal discharge, it follows that the types of seizures are numerous and depend on the regions in the brain from which the attacks arise. Furthermore, since the causes of seizures are manifold, the same pattern of seizures may result from a variety of cerebral lesions. Consequently, when the clinician sees a patient with seizures, he must seek answers to two questions: 1. *From what anatomic site do the seizures arise?* 2. *What is the underlying pathologic process?*

A satisfactory history is essential. This history must include a description of the onset of the major seizures or the evolution of the minor ones. This will make clear the anatomic site of origin.

Read at the meeting of the Southern Minnesota Medical Association, Hutchinson, Minnesota, September 8, 1958.

The Mayo Foundation is a part of the Graduate School of the University of Minnesota.

Analysis of the longitudinal course of the disease, including the age of the patient at onset, possible precipitating factors and the subsequent course of the illness, often suggests the underlying pathologic process. Since an attack is characteristically paroxysmal, stereotyped and brief—in other words, a discrete event—the patient himself often may give a detailed and complete description of it. However, patients must be questioned closely and required to define their terms with as much care as possible, since they often use vague and generalized terms as "dizziness," "forgetful spells" or similar phrases. The physician must be willing to listen to the patient, and a feeling of sympathy and understanding must be communicated to him. At times, the bizarre nature of the subjective experiences during an attack may make the patient reluctant to discuss them even with his physician. This is particularly true when the patient has reported these phenomena previously and has met with disregard, incredulity or contempt on the part of a physician. Yet with patience, a precise description of the attack can be obtained.

Differential Diagnosis

The differential diagnosis includes all periodic disturbances of cerebral function. The commonest of these is syncope, which is secondary to diminution of cerebral blood flow. This may occur as a simple faint, or it may be secondary to such conditions as postural hypotension or irregularity in cardiac rhythm. These attacks are more gradual in their onset and of longer duration than are episodes of true epilepsy. The patient describes the attack as beginning with a graying-out of vision. This is associated with unsteadiness and rapidly progresses to flaccid paralysis and unconsciousness; the patient usually slumps to the floor. Following the attack, the patient usually has no evidence of persistent symptoms.

Anxiety attacks are another common cause of such cerebral symptoms. The most frequent mechanism of anxiety attacks appears to be hyperventilation. The patient who has anxiety attacks frequently complains of shortness of breath associated with the fear of death, anxiety, and numbness and tingling in the fingers and about the mouth. These symptoms crescendo over a period of a few minutes and may be followed by a graying-out or even a blacking-out.

Less commonly, cerebrovascular insufficiency secondary to partial stenosis of one of the cranial arteries may cause symptoms suggestive of epileptic disorder. Although this disturbance occurs infrequently, the therapy is sufficiently different to warrant careful diagnosis. Episodes of cerebrovascular insufficiency customarily occur in patients in the older age groups. The attacks are characterized by a constellation of symptoms that can be explained by insufficiency of blood in that portion of the brain supplied by one of the major cerebral arteries. The attacks tend to persist over a longer period than the customary thirty seconds to five minutes of the epileptic seizure. Furthermore, they build up more slowly, as contrasted to the abrupt onset of the epileptic attack, and the progression of symptoms differs from that described by the epileptic patient. Each new symptom persists throughout the attack, unlike the spread in focal epileptic disorders, in which the symptoms often begin in one region only to spread to another without the initial symptom persisting throughout the attack.

Ménière's syndrome rarely may be confused with epileptic disorders. Occasionally, the attacks of vertigo occur so abruptly and are associated with so much disturbance of equilibrium that the patient may fall heavily to the floor and find it difficult to say whether or not he has lost consciousness. Attacks associated with Ménière's syndrome last longer (ten to thirty minutes or more) than do epileptic seizures and are associated with the usual auditory signs and symptoms of aural vertigo, so that the differential diagnosis in most instances can be made with considerable ease. It is important to remember that occasional epileptic seizures begin with true vertigo.

Various disturbances in metabolism create diagnostic problems; disturbances in blood urea and in the balance of blood electrolytes may lead to convulsive seizures. Changes in calcium metabolism may give rise to convulsions, and it is well to remember that patients with hypocalcemia may have convulsions that are impossible to differentiate from epileptic seizures. It is well known that hyperinsulinism may cause convulsive seizures. This, however, is relatively rare and such convulsions, when they do occur, are part of a more prolonged disturbance in cerebral function. Careful inquiry from the patient usually reveals that intake of food will abort such an attack.

Narcolepsy has been described as a variant of epilepsy. This differential diagnosis can be made easily, as the major symptom in narcolepsy is a

persistent tendency for the patient to fall asleep; he may be aroused without difficulty from this sleep.

Formerly, hysteria was important in the differential diagnosis and hysterical convulsions occurred frequently. In recent years, this diagnosis has become less common. Hysterical convulsions are characterized by their relatively long duration, by the tendency for the attack to occur in the presence of an audience, and by the frequent erotic character of the movements occurring during the seizure.

Aids in Diagnosis

The diagnosis of epilepsy depends on witnessing an epileptic seizure or obtaining an adequate history of such repeated seizures. It is frequently not possible for the physician to witness such a seizure and it is, therefore, necessary to obtain a careful history from the patient and his family in an attempt to diagnose such seizures. The epileptic seizure, as noted previously, is characterized by its brevity and the abruptness of its onset; the attack may occur at any time, although attacks have a predilection for the patient who is drowsy or who is awakening. The seizures in epilepsy, therefore, occur whether the patient is up and about or lying down; this is unlike the situation in syncopal attacks and anxiety attacks, which usually take place when the patient is erect. A relationship often is present between emotionally traumatic events and the epileptic seizure. Not infrequently, some relationship occurs between the seizure and fatigue.

In addition to the history, it is essential to obtain an adequate medical and neurologic examination. Every patient should have roentgenograms of the head, and an electroencephalogram should be obtained. Roentgenograms of the head are of particular value in the diagnosis of the cause of epileptic disorders, particularly those associated with brain tumors. The electroencephalogram is of value not only in the diagnosis but also as an aid in the classification of the epileptic disorders, and thus it may be of value in determining proper treatment. Examination of cerebrospinal fluid, air encephalography or angiography may be necessary to arrive at a definitive pathologic diagnosis. However, it is hardly necessary to reiterate that the diagnosis is not made on the basis of these laboratory tests but on the basis of an adequate history.

Once the diagnosis of epilepsy is determined, the physician may plan his strategy of treatment. This consists for the most part of three phases, namely (1) recognition, when possible, of the causes of the convulsive disorder and their eradication, (2) when eradication of the cause is not possible, instruction of the patient in how to live with his illness and (3) specific treatment for the epileptic symptoms.

Classification of Epilepsy

Classification of these epileptic disorders is essential for the proper handling of the causes, the social management and the treatment of the patient with epilepsy. We have found it most useful to classify the epileptic seizure by its clinical symptoms. Thus, epilepsy may be differentiated into grand mal, petit mal and focal seizures.

Grand Mal.—Grand mal seizures are those which are universally recognized as epileptic seizures. The attacks begin with unconsciousness and a tonic contraction of the body musculature. The eyes roll upward, the legs are extended, and the arms are flexed. The strength of the muscular contraction causes forced expiration of air from the lungs. The tongue is frequently caught between the teeth, the bladder and rectum may be emptied, and the patient falls forcefully to the ground. The tonic stage persists for a few seconds to half a minute, and the patient may become cyanotic during it. The clonic convulsive stage then develops, and the body and extremities jerk and twitch. After a few minutes, the muscles relax, the patient regains partial consciousness and his color improves. He then is somewhat confused, complains of headache and muscular pain, and usually falls into a deep sleep. Spread of the discharging cerebral focus in either petit mal or focal seizures may result in a grand mal attack.

Petit Mal.—Petit mal seizures are those attacks in childhood consisting of transient lapses of consciousness associated with spikes and waves in the electroencephalogram at a rate of three per second. These attacks are brief, lasting a few seconds; they are frequent, and may occur many times daily in the untreated patient. The attack itself consists of sudden loss of consciousness, with the patient appearing to stare into space. There may be movements about the eyelids and head and sometimes the upper extremities. The patient is mentally clear up to the onset of the seizure and appears normally alert at the end of the spell. At-

tacks of petit mal occasionally may be followed by a grand mal seizure.

Focal Seizures.—Focal seizures are those epileptic attacks whose initial clinical symptoms suggest irritation of a discrete region of the brain. These seizures at times may spread to become grand mal attacks. My associates and I have found it useful to divide all focal seizures into two broad categories. The first type we have called "splanchnopsychic" seizures. This term includes all seizures initiated with complex hallucinations, perceptual or conceptual illusions, affective states and various autonomic phenomena involving the cardiovascular system, the abdominal viscera and the respiratory system (in short, what we have described previously as "visceral seizures").[3] Such seizures may terminate in confusional states (automatisms) or generalized convulsions. In general, this category consists of what previously have been called "temporal-lobe"[4] or psychomotor seizures. We chose a behavioral term for these attacks because the so-called temporal-lobe seizures are not invariably associated with lesions in the temporal lobe, and the term "psychomotor" did not appear to stress sufficiently the frequent visceral symptoms. The remaining category, termed "sensory-motor seizures," includes all focal somatomotor seizures (jacksonian seizures), so-called supplemental motor-area seizures, adversive seizures and crude somatosensory and visuosensory seizures.

Etiology: Brain Tumors as a Cause of Epilepsy

Epilepsy is a symptom and each epileptic seizure is the result of multiple causes. Certain morbid states of the brain produce epileptic seizures as part of their characteristic symptoms. The recognition and differentiation of these specific "causes" are of importance in the proper treatment and diagnosis of epileptic disorders. As these "causes" previously have been considered in detail in another paper,[5] this discussion will be limited to brain tumors, which are a common cause of epilepsy and require definitive and separate treatment.

Ten per cent of the epileptic patients seen at the Mayo Clinic have brain tumors. The following clinical criteria suggest to the physician that further diagnostic studies to eliminate brain tumors are required in patients with epileptic seizures: 1. Onset of the seizures was between the ages of thirty and sixty years. 2. The epileptic seizures are focal in type. 3. The duration of the illness is less than five years. 4. Progressive alteration has occurred in the epileptic symptoms.

The following clinical criteria suggest that brain tumors need not be seriously considered as the cause of epileptic seizures: 1. Onset of epilepsy was before the age of twenty, and the patient has a normal skull roentgenogram. 2. The epileptic seizures are petit mal in type. 3. The duration of illness is more than ten years. 4. The epileptic symptoms have remained constant.

Diagnostic tests that are of value in determining whether a patient has a brain tumor include neurologic studies, with careful funduscopic examination, roentgenography of the head and electroencephalography. If results of these studies are normal, it is permissible to assume for the moment the absence of brain tumors in patients with seizures that began before the age of twenty. Obviously, all patients should be carefully re-evaluated periodically.

In patients who have focal seizures beginning in adult life, a structural lesion, possibly a tumor, must be assumed to exist. Failure to demonstrate such a lesion by additional studies, such as angiography and pneumoencephalography, does not preclude the existence of a tumor, and the patient must be carefully re-examined at regular intervals. In such patients, the additional findings of focal abnormalities in electroencephalograms, focal neurologic signs, or focal changes in roentgenograms of the skull increase the level of suspicion and may enable the physician to make a positive diagnosis of brain tumor in certain patients.

Orientation of the Patient

When the diagnosis of epilepsy is established and a remediable cause has not been discovered, it is customary to make a diagnosis of idiopathic epilepsy. The patient and his family will be concerned about the prognosis of the illness and the limitations it will impose on him. The patient can be told that many epileptic patients (about 50 per cent in our series)[1] have fewer than four convulsions a year and that convulsions are more common in infancy and again in adolescence. The occurrence of epileptic seizures in infants secondary to recognized illness need not be regarded as the inevitable beginning of an epileptic disorder.[6,7] In our experience, it is not uncommon for patients with epileptic disorders to have complete and apparently permanent remissions.[1] The social adjustment of most epileptic patients is good, and

many epileptic patients lead natural and normal lives in school, at home and at work.[5] In prognosticating whether a given epileptic patient will be able to make a satisfactory social adjustment, the age at onset of the disease appears to be of crucial significance.[8] If the convulsive disorder began prior to the age of ten (more specifically, if it began in the first year of life), the patient's adjustment is uniformly poor.

As already noted, the patient and his family are vitally concerned with the restrictions that his disease places on him. The commonest legal and social restriction has to do with marriage. The patient must be told that a wholly satisfactory answer cannot be given at present to the problem of heredity in epilepsy.[9,10] In our experience, heredity plays a definite although a minor role in the causation of epileptic disorders. Thus, one can suggest to the epileptic patient that his children will have a greater-than-average chance of having epilepsy and that this chance will be diminished by marrying a mate with no epileptic history in the family. The physician must advise patients who have epileptic disorders that they should not drive automobiles or engage in any other activities in which they may injure others while the epileptic attacks are uncontrolled.

Restriction should be placed on the use of alcoholic beverages, and the patient should be advised to avoid sports in which head injuries may occur.

Specific Treatment

Treatment in epilepsy is aimed at control of seizures. This is achieved through a variety of methods that may be used simultaneously or separately and are perhaps best classified as psychologic, medical, dietary and surgical. In addition to these specific methods, it is important to discuss with the patient and his family general measures of control. These include the necessity of avoiding excesses and maintaining regular hours of sleeping and eating, for it is well known that persons are particularly prone to have epileptic seizures during fatigue and relative hypoglycemia. The necessity of avoiding unusual emotional stress should be discussed. Relatives must be encouraged to avoid oversolicitous care and protection of the patient. The social handicap remains out of all proportion to the seriousness of the disease.

Psychologic Treatment.—In any illness in which the social handicap is as great as it is in epilepsy, the frequent need for specific psychotherapy to aid the patient in living with his illness is obvious. In addition, specific psychiatric treatment in patients with epilepsy may so alter the stress situation that precipitates attacks as to aid materially in the control of the seizures.

Medical Therapy.—Medication remains the principal tool of the physician in his treatment of epileptic patients. Phenobarbital, diphenylhydantoin (dilantin) sodium and trimethadione (tridione) are the principal drugs used. Drug therapy must be individualized; the proper dose is one that controls convulsions with no or minimal symptoms of toxicity. In the use of these drugs, certain general rules can be applied:[5] 1. Therapy is begun with a simple and safe drug at a minimal dose. 2. The dose of the medicament is gradually increased over a matter of weeks until the seizures are controlled or toxic symptoms appear. 3. In most instances, it is necessary to use more than one drug simultaneously. The therapeutic action of these drugs appears to be synergistic rather than cumulative. 4. Alterations in dose must be gradual and at no time must administration be discontinued suddenly. 5. Once the optimal dose is reached, it must be maintained for years. 6. The medical regimen must be tailored to fit the patient, as the pattern and timing of his attacks will be unique to him.

Treatment of most patients with grand mal or focal seizures is best started by use of diphenylhydantoin (dilantin) sodium. The initial dose is 0.1 gm. two or three times a day. The dose may be gradually increased to a total of 0.6 gm. daily in divided doses. For children less than six years of age, the initial dose is 0.032 gm. three times a day; for children six years of age or older, the initial dose is 0.1 gm. twice daily. The toxic manifestations produced by this drug are seldom serious; they include gastric discomfort and nausea, which may be obviated by taking the drug with meals or with sodium bicarbonate. Hirsutism may be an unpleasant side effect in girls and young women. Hyperplasia of the gums is a secondary effect that is reportedly retarded by massaging the gums. The only practical method of control is surgical removal of the hypertrophied gums. More serious symptoms of toxicity include nystagmus, ataxia and diplopia. These usually respond to reduction of the dose. Fever, polyarthropathy, blood dyscrasias and cutaneous eruptions are rare side

effects of dilantin therapy that necessitate discontinuance of its administration.

The convulsions in many patients with grand mal or focal seizures are best controlled by using phenobarbital and dilantin concurrently. A satisfactory dose with which to begin is 0.1 gm. of dilantin three times a day, with 0.016 gm. of phenobarbital given at the same time. The dose of phenobarbital then may be gradually increased to tolerance, beginning with a nightly dose of 0.032 to 0.1 gm. An effective dose for many adults is 0.1 gm. of dilantin with 0.032 gm. of phenobarbital given three or four times a day. These drugs are now available combined in varying doses in one capsule.

Use of trimethadione (tridione) is a treatment of choice in patients with petit mal. Its administration may be started in doses of 0.3 gm. daily, with gradual increases in adults and adolescents to total doses of 2.7 gm. daily in divided doses. Patients frequently complain of photophobia and hemeralopia, which may disappear with continued use. Toxic dermatitis may occur, but it also responds to withdrawal of the drug. In children, the dose should be proportionate to weight. In most patients, it is wise to use in addition phenobarbital or dilantin to avoid grand mal attacks. Unfortunately, serious complications such as aplastic anemia, agranulocytosis and nephrosis have been reported; their appearance necessitates discontinuance of administration of the drug. Because of these complications, patients receiving tridione must be carefully observed, and monthly urinalysis and routine blood studies are indicated.

Status epilepticus or recurrent seizures are best controlled by the intravenous injection of 0.4 to 0.8 gm. of phenobarbital sodium or 0.5 to 1 gm. of amobarbital sodium in distilled water. In children, half this amount is required.

Many other drugs have been reported as efficacious for epilepsy in recent years.[11] However, none of these have proved as satisfactory or safe as phenobarbital, dilantin and tridione. When these three drugs are ineffective, one may consider the use of one of the newer drugs, recognizing that the toxicity of these drugs is not as yet well delineated.

Discontinuing Therapy.—Prior to withdrawal of medication, the patient should understand and be willing to assume the responsibility for an increased risk of convulsive seizures. If the patient still wishes to consider withdrawal, he should be advised to do it slowly over an interval of several months. In addition, it would appear wise for the patient not to discontinue therapy during adolescence or any other period of undue stress.

Dietary Therapy.—In the past, a ketogenic diet has proved successful in the treatment of convulsive disorders.[12] However, the use of drugs is usually simpler than maintaining a patient on such an unpalatable diet for any length of time. The ketogenic diet now appears to have its main usefulness in children whose condition cannot be controlled adequately with drugs.

Surgical Therapy.—Surgical intervention has been advocated as the treatment of choice for patients who are handicapped by focal seizures that cannot be controlled medically. In such patients, surgical extirpation of the cerebral focus from which the seizures arise may be considered. This form of treatment is still in the process of final evaluation.

References

1. Mulder, D. W., Yoss, R. E., Daly, D. D., Rushton, J. G., and Dodge, H. W., Jr.: Symposium on the clinical significance of epileptic seizures. Proc. Staff Meet., Mayo Clin., 33:467-496 (Oct. 1) 1958.
2. Sections of Neurology and Section of Physiology, Mayo Clinic: Clinical Examinations in Neurology. Philadelphia: W. B. Saunders Company, 1956.
3. Mulder, D. W., Daly, David, and Bailey, A. A.: Visceral epilepsy. A.M.A. Arch. Int. Med., 93:481-493 (Apr.) 1954.
4. Mulder, D. W., and Daly, David: Psychiatric symptoms associated with lesions of temporal lobe. J.A.-M.A., 150:173-176 (Sept. 20) 1952.
5. Mulder, D. W., Daly, David, Rushton, J. G., and Yoss, R. E.: Treatment in epilepsy. Postgrad. Med. (In Press).
6. Lennox, W. G.: Significance of febrile convulsions. Pediatrics, 11:341-356 (Apr.) 1953.
7. Thom, D. A.: Convulsions of early life and their relation to the chronic convulsive disorders and mental defect. Am. J. Psychiat., 98:574-580 (Jan.) 1942.
8. Keith, H. M., Ewert, J. C., Green, M. W., and Gage, R. P.: Mental status of children with convulsive disorders. Neurology, 5:419-425 (June) 1955.
9. Alström, C. H.: A Study of Epilepsy in Its Clinical, Social and Genetic Aspects. Copenhagen: Munksgaard, 1950.
10. Lennox, W. G.: The heredity of epilepsy as told by relatives and twins. J.A.M.A., 146:529-536 (June 9) 1951.
11. Merrit, H. H.: Medical treatment in epilepsy. Brit. M. J., 1:666-669 (Mar. 22) 1958.
12. Keith, H. M.: Results of treatment of recurring convulsive attacks of epilepsy. Am. J. Dis. Child., 74:140-146 (Aug.) 1947.

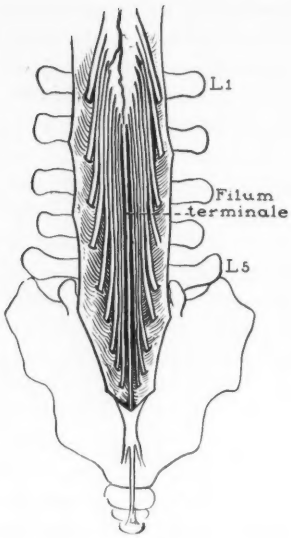


Fig. 1. Anatomic relationship of the filum terminale to the conus medullaris and the lumbar and sacral vertebrae.

The So-called Tight Filum Terminale Syndrome

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• *"It's Tight Like That" is the theme of a classic piece of jazz that can be applied on occasions to the filum terminale, which represents the caudad portion of the spinal cord that normally becomes a fibrous strand. If this strand is not long enough, it puts tension on the conus medullaris and roots of the cauda equina. The author illustrates the relatively specific neurologic disorder associated with a tight filum terminale.*

THE so-called filum terminale syndrome unfortunately has become a loosely applied term to designate any number of clinical entities whereas in reality the syndrone does represent a circumspect clinical picture which can be recognized.[1,2] The filum terminale frequently has remnants of ependymal cells which undergo tumorous changes from which lesions arise. However, inadequate differentiation of the filum during the period of body growth, with lengthening of the filum as the vertebral column descends, can exert sufficient traction on the roots of the cauda equina and the conus medullaris to produce a demonstrable neurologic disorder.

A brief anatomic review of the filum terminale will help define the relationship of this structure to the syndrome which bears its name. The filum represents that portion of the spinal cord, caudad to the second coccygeal segment, which finally becomes converted into a fibrous strand. [3,4] This strand elongates in adaptation to the ascending displacement of the spinal cord. The caudal tip of the dural sac maintains its relationship to the

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vertebrae rather than to the spinal cord, and remains attached to the filum terminale in the sacral region at a more or less fixed point.[5] The terminal end of the filum is fixed to the coccygeal ligament, of the lumbosacral or sacral coccygeal area sometimes is encountered. There may be skeletal dysraphia or even diastematomyelia. The development of progressive spastic paralysis while patients are

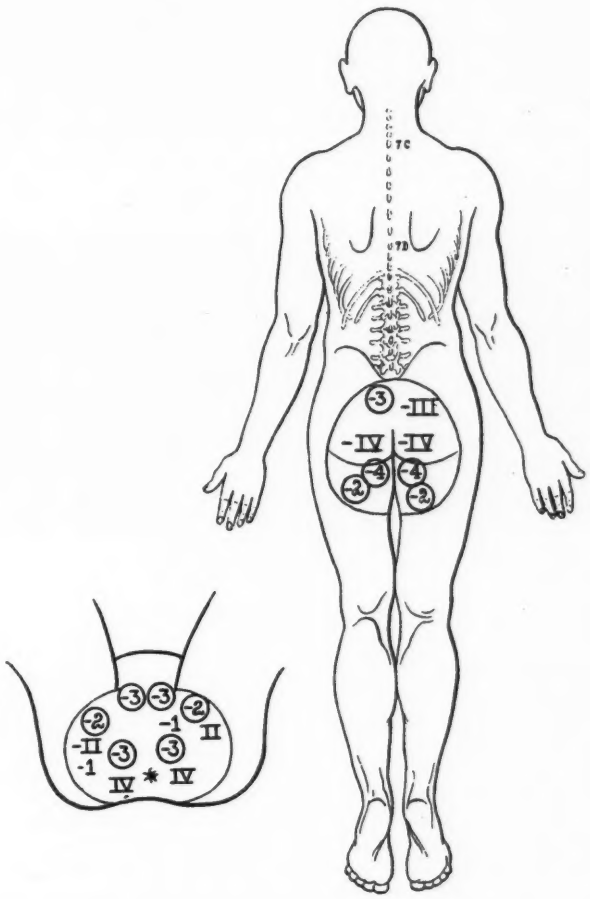


Fig. 2. Sensory changes as noted in Case 1.

while the more cephalic portion persists as the ventriculus terminalis[6] of the conus medullaris (Fig. 1). Ordinarily, the filum terminale is not under tension and merges imperceptibly with the conus medullaris.

The symptoms of progressive spastic paralysis of the lower extremities, with or without urinary difficulties in the adolescent patient, should suggest the possibility of a tight filum terminale. Spina bifida occulta or dimpling of the skin in the region under observation for other conditions should arouse suspicion of the syndrome.[1]

Two Illustrative Cases

Two patients who presented the symptoms of, and in whom the observations pointed to, an unexplained progressive paraparesis of the lower extremities suggested the possibility of a tight filum terminale, and the clinical findings in the cases were of sufficient interest to warrant this report.

Case 1.—In 1945 a woman, aged thirty-three, noted on one or two occasions loss of a few drops of urine while she was up and about. She had no additional difficulty of this kind until 1947, when she consulted her local physician because of recurrent pains in the right lower abdominal quadrant. Appendectomy was performed, and cysts in both ovaries were punctured. Between 1951 and 1954 the patient experienced frequent bouts of urinary difficulty consisting of incontinence, urgency and dribbling. She was forced to wear a perineal pad most of the time. She also began to notice alteration of her bowel habits, and began to take laxative agents and enemas. In 1955 she first noted relaxation of the anal sphincter and soiling of her undergarments by fecal material. For several years before we saw her, fecal incontinence had become progressive. In 1956 she saw her local physician because of the foregoing symptoms and because she was also noticing some pain in the lower part of the back. This pain extended into the right leg and as far as the popliteal region and the foot. It was not lancinating nor did it seem similar to the pain of true sciatica. Weakness and heaviness of the right leg and foot ensued. All these symptoms had gradually progressed. More recently, coughing, sneezing and straining, as well as lifting objects or jarring or riding in a car, aggravated the pain in the back as well as that in the right leg. When the urinary bladder was examined for residual urine, retention of between 200 and 300 cc. of urine was found.

In June 1956, the patient was admitted to a hospital near her home, where a myelogram (pantopaque) was made. Results were reported as normal, and the value for protein in the cerebrospinal fluid also was found to be within normal limits. In April and May 1957, the patient was re-admitted to the same hospital because of an infection of the urinary tract, and at this time 1400 cc. of residual urine was found, associated with definite overflow incontinence. Another pantopaque myelogram was made and was reported as disclosing nothing abnormal.

The patient was first seen by us in March 1958. Results of a general medical examination seemed to be essentially normal. However, at neurologic examination, the patient was found to have definite Babinski reflexes bilaterally and weakness of the lower extremities, greater on the right than on the left. A definite sensory loss to all modalities was noted in the sacral rootlets, with sensitivity to touch, pain and temperature reduced as indicated in Figure 2.

On the basis of our examination we obtained the impression that the patient probably had an intramedullary tumor in or near the conus medullaris or some rare type of sacral syringomyelia. It is of interest to note that the sensations of pain and temperature were much more severely affected, while that of touch was only slightly diminished. A pantopaque myelogram was made, but it disclosed no abnormality. The value for total proteins in the cerebrospinal fluid was 10 mg. per 100 cc. A roentgenogram of the lumbar area of the spinal column did not reveal any abnormality, and no other congenital defect of the skeletal system was found. Examination of the skin in the sacral area disclosed a small dimple near the first sacral vertebra.

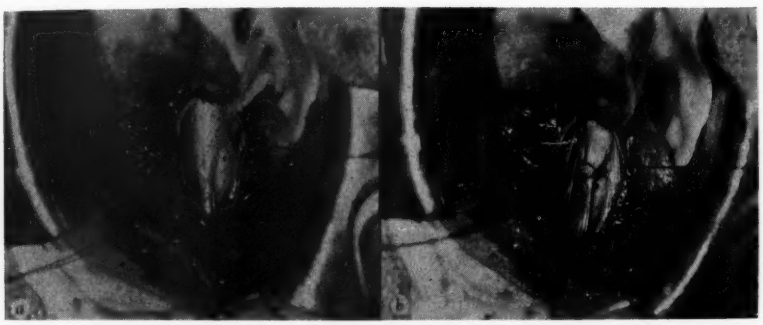


Fig. 3. *(a* and *b)* Surgical findings in Case 1.

Because of the progression of the patient's symptoms, an exploratory operation was advised. The patient accepted this counsel. On April 8, 1958, with the aid of general anesthesia, the usual level of the conus medullaris was explored in the region of the first lumbar vertebra. Minimal bilateral laminectomy was carried out. When the dura was opened, it was obvious that the conus medullaris was not located at this level. Exploration was then carried out between the third and fourth lumbar vertebrae, and again the spinal cord was observed. No evidence of a cauda equina could be found.

Laminectomy was then carried out at the fifth lumbar and first sacral levels, where the conus medullaris was found to be attached to the dura at the level of the first sacral vertebra. The conus medullaris had undergone degenerative changes and looked somewhat like a lipoma (Fig. 3*a*). Anterior to this attenuated conus was a very tense fibrous band that resembled the usual filum terminale.

First, the attachment of the conus to the dura was divided between black silk sutures (Fig. 3*b*), and then the tight filum likewise was divided. The lower elements of the conus as well as the resected filum receded upward about 1.5 cm. after the structures were cut.

The pathologist reported that the tissue submitted from the area of the conus represented fatty cells and nerve fibrils. A rubber catheter was passed rostrally for a distance of at least 8 inches and no obstruction was encountered. The catheter also was passed distally, but it would descend only for about 1.5 cm. before the end of the dural sac was reached. The operation was then terminated.

The convalescence of the patient was uneventful. It was her impression that the area of objective sensory loss was not so great at the time of her dismissal. However, neurologic examination indicated the degree of sensory loss to be about the same. The patient herself, however, felt that her legs were less spastic, that her back was stronger and that the preoperative pain and heaviness of the right lower extremity had been relieved. She no longer had any difficulty with retention of urine and, by careful around-the-clock regulation of elimination, she had no difficulty with fecal incontinence. The day before her discharge the output of urine was 425 cc., with only 30 cc. residual.

This case shows that even though a tight filum terminale was present, a congenital abnormality of the lower end of the conus medullaris also was associated. Undoubtedly, traction played a major role here and produced the progressive deterioration that has been described. We anticipate a satisfactory recovery, although much of the neurologic deficit will persist.

Case 2.—A woman, aged thirty-four, came to the Mayo Clinic complaining chiefly of deformity of the left foot, with twitching of the left leg, that had been present for ten years. The patient said that as long as she could remember she had had a deformed left foot, and that she was supposed to have had poliomyelitis at the age of eleven months. The patient was able to walk and to stand by the time children normally are able to do so. A younger half-brother of the patient had cerebral palsy with athetosis. The patient had left school in the twelfth grade because she was sensitive to the curiosity of others in respect to her slight limp. She remarked that she was still conscious of the limp and that she desisted from going about in public because of it. She had four children and was able to care for her own house as well as her children without any difficulty. She reported that if she walked two or three blocks the left ankle had a tendency to become weak and the foot to invert. She never had fallen, but the weakness produced considerable disability. She never had experienced pain, but she had noticed involuntary jerking movements in various places in the calf and leg on the left side.

Results of a general physical examination of this patient were essentially normal, except for the lower extremities. The right foot was larger than the left, and the left foot was deformed, with a talipes cavus type of alteration. There also was an anomaly of the proximal phalanx of the fifth toe of the left foot. A tarsocalcaneal coalition on the left, with the talipes cavus deformity of the foot, was noted, and there was some lateral separation of the right ankle joint, with eversion deformity.

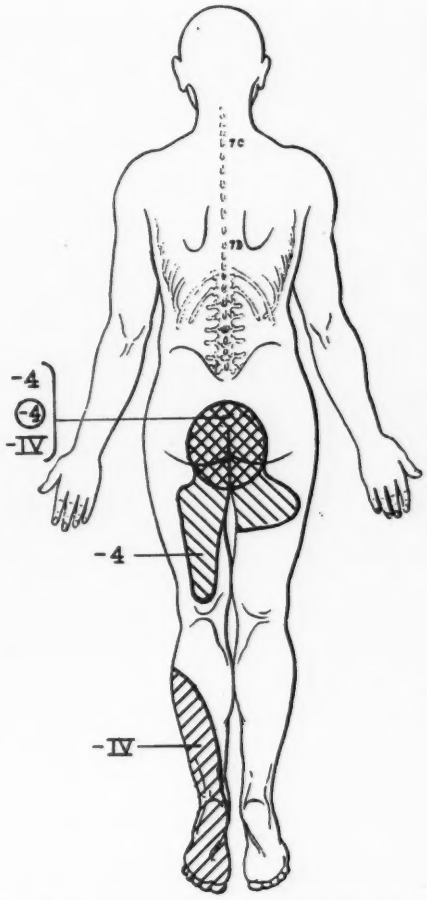


Fig. 4. Sensory changes noted in Case 2.

At neurologic examination, ankle jerks were absent bilaterally, whereas the remaining reflexes were normal. The tone of the anal sphincters was reduced, minus 2 to 3 on the basis of 1 to 4, and there was definite weakness in dorsiflexion of the toes, especially on the left. There was weakness in the adductors as well as the abductors on the left, and sensory loss to pinprick and temperature was noted, as indicated in Figure 4. A roentgenogram of the lumbar area of the spinal column disclosed no abnormality. It was not felt by the orthopedic surgeon who saw this patient in consultation that any specific treatment was indicated. A pantopaque myelogram was made on May 21, 1958. This showed the common dural sac lying posteriorly against the bony wall of the spinal canal, suggesting a tight filum terminale (Fig. 5). The

conus medullaris seemed to lie in a normal position. Otherwise the myelogram gave no indication of abnormalities. The value for total proteins in the cerebrospinal fluid was 25 mg. per 100 cc. An electromyogram also was made; it revealed damage to anterior-horn cells



Fig. 5. Contrast myelography of the lumbar portion of the spinal canal in Case 2, demonstrating the dural sac being pulled away from the anterior portion of the spinal canal.

at the level of the lumbar fifth and sacral first vertebrae.

At operation on May 21, 1958, bilateral laminectomy was carried out at the level of the fifth lumbar and first sacral vertebrae. Intradural exploration did not reveal any evidence of a tight filum terminale or an abnormal lesion of the cauda equina. Exploration was then carried out between the first and second lumbar vertebral levels, and again there was no evidence of a tight filum terminale. The conus medullaris appeared to be in a normal position; it was not malformed or surrounded by or comprised of tumor tissue. A rubber catheter was passed distally as well as rostrally, and no obstruction was encountered.

Convalescence of the patient was uneventful. It was felt that the patient probably had a congenital anomaly of the lower extremity on the left, and it might well be that as a child she had had poliomyelitis which resulted in the damage to the anterior-horn cells as indicated by the electromyogram. This case is of interest in that the same objective sensory changes were noted in this patient as were seen in the first case presented herein, but even so, a true tight filum terminale or abnormality of the conus medullaris could not be identified. However, the patient did present sufficient evidence to warrant surgical exploration to determine the presence or absence of a pathologic process.

Summary

This presentation has two objectives: first, to clarify the true situation in what usually is referred to as the "filum terminale" or "tight filum syndrome"; and second, to present some of the more prominent clinical features that should attract the attention of the examining physician when he is confronted by the problem of progressive paraparesis in an adolescent person in whom there is no other adequate explanation for the findings. It is postulated that the continued traction exerted by a filum terminale that is tight will produce degenerative changes in the lower part of the spinal cord. Hence, it is believed in such instances that early surgical intervention might prevent irreparable, progressive neurologic changes by determining the presence or absence of an abnormally low-lying conus medullaris of the spinal cord or a tight filum terminale or both. Roentgenograms of the thoracic and lumbar vertebrae, as well as contrast myelography, should be included in the measures employed in these interesting clinical problems. Whether the presence of a tight filum terminale is responsible for disorders of the central nervous system at a level higher than the conus medullaris is open to speculation.

References

1. Garceau, G. J.: The filum terminale syndrome (the cord-traction syndrome). J. Bone & Joint Surg., 35A:711-716 (July) 1953.
2. Jones, P. H., and Love, J. G.: Tight filum terminale. A.M.A. Arch. Surg., 73:556-566 (Oct.) 1956.
3. Streeter, G. L.: Factors involved in the formation of the filum terminale. Am. J. Anat., 25:1-11 (Jan.) 1919.
4. Kunitomo, Kanae: The development and reduction of the tail and of the caudal end of the spinal cord. *In:* Contributions to Embryology. Washington, D. C., Carnegie Institution of Washington, 1918, vol. 8, pp. 161-198.
5. Kernohan, J. W.: The ventriculus terminalis: Its growth and development. J. Comp. Neurol., 38:107-125 (Dec.) 1924.
6. Reimann, A. F., and Anson, B. J.: Vertebral level of termination of the spinal cord with report of a case of sacral cord. Anat. Rec., 88:127-138 (Jan.) 1944.

Many persons have thoughts about death even though they are unlikely to discuss them in casual conversation. These feelings may be brought into sharp focus during illness or old age. The physician is in a key position to discuss the problem of death with his patient or listen with wisdom to the patient's expressions. The author reviews some interesting findings on this generally neglected subject.

Attitudes Toward Death Among the Aged

Their Significance in the Practice of Geriatric Medicine

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WE, IN AMERICA, proudly label ourselves a youthful nation; but within our structure there exists an interesting and somewhat paradoxical fact—we are a rapidly aging population. Man's life span continues to increase in a spiral fashion. At the time of Christ, human life expectancy was said to be about twenty years. During the American Colonial period that expectancy had increased to thirty-five years. In 1850 man could expect to live about forty years, and now we hold hopes for a seventy-year life span. Today about 9 per cent of our U. S. population is over the age of sixty-five. This problem is obviously significant from the point of view of the medical sciences—especially when one discovers that 72 per cent of individuals over age sixty-five report at least one chronic illness.

The gerontic population with all its complexity and variability does have one common experience to be anticipated—death. The temporal aspect of life is perhaps one of the most empirically tested scientific facts known to man. A half century ago death came earlier in the human race, and the death process was experienced mostly in a sudden or traumatic manner by individuals gainfully employed or otherwise functioning well in society. Now, in the middle of the twentieth century, death commonly comes to individuals who have long since been retired from active social participation and are physically or psychologically incapacitated—presumably giving them considerable time to contemplate death as an impending experience. This development poses a number of rather stimulating questions—What are some of the characteristics of this "death contemplation"? Does it exist in all individuals? If so, can it be measured? Do millions of gerontic individuals all have the same ideas concerning death? In what manner do they deal with the problem? As they grow less and less productive in our society, do they have less and less a desire to live?

The medical sciences seem to have a singular goal or aim which cuts across lines of both research and clinical medicine—to preserve human life as long as possible. Hospitals of many types are now devoting wards or even buildings to the collocation of elderly people who, by present standards, have no useful place in our culture, but still do not die.

This paper was developed, in part, from a doctoral dissertation presented to the faculty of the University of Minnesota, 1958, and read at the annual meeting of the Southern Minnesota Medical Association, Hutchinson, Minnesota, September 8, 1958.

As the general practitioner begins to spend more time with the care and treatment of the geriatric patient, he no doubt becomes more sensitized to this problem area. A number of queries here would seem pertinent. How much does the geriatric patient think about death, if he thinks of it at all? Does he tend to fear the death experience, look forward to it, or repress it completely from his conscious thought? What role should the family physician play in discussing the possibilities of death with either the patient or his relatives? Should the physician assume that his geriatric patient is suffering from a relatively intractable fear of the death experience or can he conclude that elderly individuals have resolved the problem of death? Just how much is anxiety of death related to either vague or well-defined psychosomatic complaints of the patient?

In an attempt to answer these and many other related questions, this investigator recently set out to measure the attitudes about death of a large number of gerontic individuals.

The Literature

Little medical research has been done in this area to date. Eissler[1] has evaluated the dying patient from a psychiatric point of view. Warbasse[2] feels that the medical profession has a particular responsibility in teaching old people how to die, and it is his (the physician's) duty to make the patient free of the discomforts surrounding this experience. Williamson,[3] in writing about the fears of older people, postulates that our present-day society with its cares, anxieties, and torments resulting from an emphasis on a fear of the unknown, have caused a distinct increase in the fear of death. He takes a highly religious stand regarding the problem in stating that if man has a degree of certainty about life-after-death he will have no cause for fear of death.

Psychologists have had little more success in attempting to spell out the death concept in older people. Klopfer[4] found that the more active aged individuals had less fear of death than did the inactive ones. Feifel[5] interviewed forty white men, veterans of World War I at a Veterans Administration Domiciliary, and found his subjects either visualize death as the dissolution of bodily life and the doorway to a new life, or to view the experience with "philosophical resignation" or as "the end." None of these studies, or other similar ones, seems to give any explicit answers to the questions previously posed by this investigation.

Method

The present investigation described here involves an attempt to obtain an objective measure of the death attitudes of a reasonably good cross-section of aged individuals. A brief description of the procedure follows.

1. Thirty-four individuals, over age fifty, were asked to place their immediate thoughts concerning death into the form of a brief essay. This material was methodically screened for descriptive statements about death. Thirty-five of these descriptive statements evolved from the screening process and were used to measure the death attitudes in the larger group to be studied. The descriptive statements in this thirty-five-item check list fell rather clearly into three major categories describing death: first, a group of *positive or forward-looking* attitudes exemplified by such statements as "it will be wonderful," "promise of a new and better life," and "all troubles will be over"; second, an *evasive* attitude toward death exemplified by such statements as "don't think about it," "have nothing to do with the subject," and "feel fine and no reason to think about it"; and third, a *fearful* attitude toward death exemplified by such statements as "the end of everything," "terror overcomes me," and "dread the thought of it."

2. This Death Attitude Check List was presented to more than 200 individuals, all over the age of sixty years. The subjects were obtained from three separate sources: (a) homes for the aged, (b) so-called golden age clubs, and (c) a number of industries and companies employing individuals over the age of sixty years.

3. On the basis of their responses to the Check List the subjects were divided into three rather well-defined groups—those looking forward to death positively, those avoiding any thought of death, and those fearing the death experience.

4. These derived groups were analyzed to determine the relationship, if any, between attitude toward death and certain measurable physical and social characteristic. One general assumption was made—the closer the proximity of death through age, illness, loss of relatives, and so forth, the more acceptant or positive would be the indi-

vidual's death attitude, that is, the more he would welcome or look forward to death. Some specific predictions are implicit in this general statement.

Age.—The older the individual, the more positive and acceptant will be his attitude toward death.

Physical Condition.—The poorer the individual's physical condition the more positive will be his attitude toward death.

Home Living Conditions.—The more solitary man's home situation and the less his financial security, the more he will look forward to death.

Religiosity.—The more fundamental one's religion and the greater his religious activity, the more positively he will look forward to death.

Results

Tabulation of the results revealed the following general breakdown of the subjects with regard to their death attitudes.

1. Almost half the group (45 per cent) admitted to a positive or forward-looking attitude toward death.

2. Also almost half the group (44 per cent) were distinctly evasive in their attitudes, indicating they preferred not to think about death.

3. Only a small and relatively insignificant number (10 per cent) admitted to having any fear of the death experience.

Some specific predictions were made with regard to the relationship between death attitudes and age, physical condition, home living conditions, and religiosity. Using accepted statistical techniques, the significance of these relationships was determined. A brief résumé of the results follow.

By far the most significant relationship was found in the individuals' religious beliefs and activities and their death attitude. Persons engaged in frequent religious activity or demonstrating a fundamentalist type of religion evidenced a very positive or forward-looking death attitude, whereas those with little religious activity or interest either evaded reference to death or feared it.

The second most significant relationship occurred with regard to the subjects' living conditions and their death attitudes. Individuals residing in homes for the aged commonly looked positively toward the death experience. Individuals living with spouse or alone tended to evade the issue of death. There was some evidence to suggest that a fear of death was found most commonly in those individuals who lived alone outside a rest home.

The relationship between death attitude and level of education and condition of health was of much less intensity and showed only suggestive significance. The more educated subjects (college trained) either looked forward positively toward death or feared it, whereas the less educated (grade school) were evasive and preferred not to think of it. In other words, the educated individual faced the problem of death—either looking forward to it or fearing it, and the less educated individual avoided considering it. With regard to the relationship of general health to death attitude, the evidence suggested that those individuals admitting to good health were actively evasive in the consideration of death, whereas, those indicating poor health tended to have a positive or forward-looking attitude.

No relationship could be demonstrated between type of death attitude and sex, age, occupational status, or source of income.

Discussion and Implications

Let us now re-examine the essential results of the study with a consideration of more practical conclusions to be drawn from the data—especially with respect to their possible application to the practice of geriatric medicine.

1. The first and perhaps most significant result of this investigation is that it has demonstrated that death attitudes can be objectively measured with a structured psychometric device. It now seems neither necessary nor scientifically practical to attempt to determine a person's attitude toward death by devious or indirect methods—through the "tapping of the unconscious." It is apparent that to obtain a "death attitude" from an individual, one need merely ask some direct questions about it.

2. Fear of death tends to be relatively nonexistent in the conscious thought of the aged. At least the average gerontic individual does not consciously admit a fear of death. He either looks forward to it or evades any reference to it. For the physician treating the geriatric patient, this problem of conscious fear of death, then, need not necessarily be considered as serious. It is reasonable to assume that the average geriatric patient has either developed a philosophy of life

which makes death a fairly pleasant positive experience or he has repressed beneath the level of consciousness any concern about it.

3. Religion and religious activity apparently play a very intrinsic role in the gerontic individual's concept of death. Positive or forward-looking death attitudes were found most frequently in the actively religious group. The obvious conclusion here is that the person of firm Christian beliefs or convictions has a more positive religious orientation and therefore looks forward to the experience of death. This facet of the problem seems pertinent in the practice of geriatric medicine—a knowledge of an individual's religious convictions and habits may well give the physician distinct clues as to the amount of conscious fear of death existing in his patient.

4. Individuals living in homes for the aged look forward positively to death much more than do certain non-institutionalized gerontic people, whereas those living alone tend to fear the prospect of death. It is apparent that living a solitary existence in old age is associated with a more negative or fearful concept of death. Fear of death, then, seems to be related to solitude. One can infer from these results that older individuals living under relatively normal circumstances—that is, with husband, wife, or other relative, do not concern themselves with the process of death and therefore neither look forward to it nor fear it. Avoidance of death contemplation seems to be associated with the more normal type of social environment.

5. The possible implications of the slight relationship between educational level and death attitudes are of interest. As has been indicated, the individual with relatively little education seems to give less concern to the problem of death (perhaps not understanding its complexity), and, therefore, wants no part of discussing it. The educated person, having confronted the problem directly, has either resolved it through some sort of religious or philosophic adjustment or has become frustrated in dealing with the concept and has yet met with no solution—thereby fearing the death experience.

6. One final observation with regard to the discovery of positive relationships. It is apparent from the data that individuals in poor health tend to actually look forward to death more than fear it. It seems reasonable to infer, then, that the physician treating the terminal geriatric patient need not assume any predominant fears in his patient, but rather expect the existence of rather well-organized, positive, forward-looking attitudes toward death. The fact that individuals in good health avoid contemplation of death no doubt reflects the obvious fact that they have simply not yet found the immediate necessity or perusing it.

7. The negative results of this study are also of some significance. Chronologic age, itself, seems to have no value in predicting thoughts concerning death, and there is no evidence of a sex difference in contemplation of death.

Conclusions

It is hoped that some of the conclusions of this study may be of practical value in the consideration of the total personality of the geriatric patient as he is seen and treated in a medical setting. Death is truly a universal experience contemplated by all men. Evaluation of this contemplation would seem to be an intriguing subject of consideration not only for the theologian, philosopher, and psychologist, but also for the physician. For who, more than the practicing physician, deals with individuals, old or young, who are so concretely aware of the possibility of termination of life? Although not explicit in the objective results outlined in this research, I am convinced that individual man considers, ponders, and contemplates this most significant experience of his life much more intensely than is generally believed. The problem is a vast and multivariate one which should demand the careful consideration of many disciplines.

Leonardo da Vinci is claimed to have stated: "While I thought that I was learning how to live, I have been learning how to die."

References

1. Eissler, K. R.: The Psychiatrist and the Dying Patient. New York: International Universities Press, 1955.
2. Warbasse, J. P.: The ultimate adventure. Geriatrics, 11:468, 1956.
3. Williamson, P.: Fear in elderly people. J. Am. Geriatrics Soc., 1:739-742, 1953.
4. Klopfer, W. G.: Attitudes toward death in the aged. Unpublished M.A. Thesis, City College of New York, 1947.
5. Feifel, H.: Older persons look at death. Geriatrics, 11:127-130, 1956.

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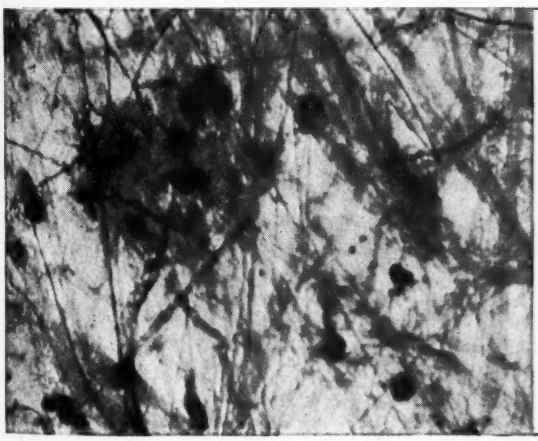
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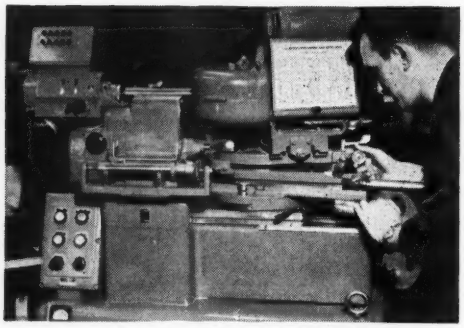
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Left-sided Pneumatosis Coli

Report of a rare condition now becoming more generally recognized.

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PNEUMATOSIS COLI is an entity which is being recognized with increasing frequency during the past few years. This is, in all probability, due to the increasing number of sigmoidoscopic examinations being done.

As early as 1952 Koss[1] reviewed the literature and found thirteen of 213 reported cases of intestinal pneumatosis where the cysts were limited to the large bowel. Since that time, increasing numbers of cases have been reported and one would conclude that this entity is more common than was at first thought. The entity can be recognized by sigmoidoscopic examination and major surgery avoided in most cases. Pneumatosis should be suspected whenever multiple sessile polypoid-appearing areas with pale tense colonic mucosa are visualized on proctoscopic examination. Biopsy will confirm the diagnosis.

Littman[2] gives a very excellent description of the sigmoidoscopic appearance of this entity. He describes the proctoscopic picture as "numerous cyst-like globular masses protruding into the lumen in a scalloping manner, partially occluding it." The mucosa covering the cysts is pale, tense and seems fixed. He also states that after biopsy the wound appears honeycombed, and bleeding, if any, is minimal. In Littman's cases a frothy secretion was present in both instances; however, I personally have observed this in numerous patients without pneumatosis and would be inclined to believe this was not a significant finding.

Presented at the meeting of the Southern Minnesota Medical Association, Lake City, Minnesota, September 9, 1957.

Pathology

It has been stated that the pathologic picture is best explained by the theory that gas distending the lymphatics with blockage of the lymphatics causes the cystic distention in the submucous and subserous layers of the bowel. In the early stages the cysts are lined by endothelial cells which later coalesce to cause multinucleated giant cells. Castleman[3] suggests that the gas in the lymphatics causes an irritation and secondary inflammatory reaction is seen around the cysts; this, in turn, causes blockage of the lymphatics with cyst formation. The composition of the gas in the cysts has apparently never been determined. The inflammatory reaction surrounding the cysts varies from the acute type with leukocytic infiltration to granulomatous changes with epithelioid cells and giant cells of the multinucleated type. In the final stages, the lining cells are sloughed off and cystic spaces without any lining are the end stage.

Etiology

Several theories as to the etiology of this disease have been proposed. The three most popular are the chemical, mechanical and nutritional. Of these three, the theory which seems to be on the firmest ground experimentally is the nutritional theory. Marshak et al[4] proposed that trauma incidental to sigmoidoscopic examination was one of the etiologic factors in this syndrome. In view of the thousands of sigmoidscopic examinations done and the mechanical trauma of hard stools, one would be inclined to discount this as an etiologic factor stince pneumatosis of the colon is relatively a rare condition.

The chemical theory of abnormal diffusion of

gasses through the colonic mucosa with subsequent cyst formation seems to defy some of the more basic laws of physics and chemistry so this, too, I believe is not a good explanation.

In support of the theory of a nutritional deficiency, it has long been observed that intestinal pneumatosis was a condition frequently observed by butchers in swine. In 1936 Biester et al[5] reported on the experimental production of these lesions in swine. Further studies by these same authors[6] have shown that a diet consisting of 78 per cent polished rice, 20 per cent skim milk and 2 per cent minerals produced pneumatosis in 100 per cent of hogs fed on this diet. The addition of 5 per cent bakers' yeast protected four of five pigs fed on this diet. A diet consisting of 50 per cent skim milk also afforded protection against emphysema. No cases of emphysema were observed if unpolished rice or whole grains were used in the diet.

From this evidence one would feel that the B-complex vitamins contained the anti-emphysema factor but the authors conclude it is some other factor since none of the animals which developed emphysema showed other signs of vitamin B deficiency. To further support their argument, they have shown that the animals' diet must contain enough B-complex vitamins to produce a weight gain of 0.5 pound per day in order to develop emphysema.

Thus, the exact etiology of pneumatosis coli in the human is completely unknown.

Symptomatology

The symptomatology is vague and it is possible that many cases of pneumatosis go unrecognized. Littman's[2] cases had vague abdominal discomfort, constipation and diarrhea, complaints which often do not cause patients to seek medical advice. The patient whose case is being reported here complained of only vague abdominal discomfort with occasional cramps and no irregularity of stool. There was no bleeding as was reported in one of Littman's cases.

Case Report

A white woman, aged forty-nine, was first seen with vague complaints of abdominal distress of an aching type. She had been seen by her family physician who noted what appeared to be multiple polypoid lesions beginning at the 8 cm. level on sigmoidoscopic examination. Her past history was non-contributory. The patient had always enjoyed good health. Laparotomy for an ovarian cyst was the only surgery reported. Routine laboratory studies were within normal limits. Barium enema studies revealed multiple polyps throughout the descending and sigmoid colon. At laparotomy and colotomy, the diagnosis of left-sided pneumatosis was definitely established. No polyps were found. Two months after the surgical diagnosis, sigmoidoscopic examination revealed almost complete disappearance of the intramural cysts. The patient was asymptomatic. No specific treatment had been undertaken other than observation.

Summary

Intestinal pneumatosis is a syndrome of unknown etiology which has been reported with increasing frequency in the past few years. Pneumatosis limited to the colon is relatively a rare condition. Of the theories proposed as to its etiology, the nutritional deficiency theory is the only one supported by experimental evidence. The syndrome is self-limited and requires no specific treatment unless complications supervene.

A case of left-sided pneumatosis coli is presented and some of the pertinent literature on this syndrome is reviewed.

Conclusions

1. The diagnosis of left-sided pneumatosis coli can be made by sigmoidoscopic examination.
2. Biopsy of the lesions through the sigmoidoscope has been done[2] and apparently is a safe procedure.
3. Once the diagnosis of pneumatosis is made, the treatment is expectant and one can expect spontaneous remission.
4. The etiology of this syndrome is very obscure and experimental evidence in animals points to a dietary deficiency and/or toxicity as the causative factor.

References

1. Koss, L. G.: Abdominal gas cysts. A.M.A. Arch Path., 53:523, 1952.
2. Littman, L.: The sigmoidoscopic diagnosis of left-sided pneumatosis coli. Am. J. Surg., to be published.
3. Castleman, B., and Towne, V. W.: Discussion of case record at Massachusetts General Hospital. New England J. Med., 250:525, 1954.
4. Marshak, R. H., Blum, S. D., and Eliasoph, J.: Pneumatosis involving the left side of the colon. J.A.M.A., 161:1626, 1956.
5. Biester, H. E., Eveleth, D. F. and Yamashiro, Y.: Intestinal emphysema in swine. J. Am. Vet. M. Ass., 41:714, 1936.
6. Eveleth, D. F., and Biester, H. E.: Further studies, intestinal emphysema of Swine. Am. J. Hyg., 27: 364, 1938.

Varicose Veins During Pregnancy

● *What should the physician advise when faced with the common problem of the pregnant woman with varicosities? Although surgical extirpation of the offending veins is the most efficient treatment, it should be postponed until some time after delivery. The author outlines conservative measures that may be used during pregnancy.*

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VARICOSE VEINS during pregnancy are very common, but their management is controversial. Some authors recommend surgical treatment (ligation and injection or stripping) during pregnancy, while others advise injections with sclerosing solutions, and still others favor conservative, nonsurgical management with elastic support. The purpose of this paper is to discuss briefly the handling of this problem as practiced at the Mayo Clinic.

The development of varicose veins during pregnancy is a well-recognized occurrence. Pregnancy imposes a definite strain on the veins of the lower extremity which often results in varicosis in a susceptible individual. Although no reliable figures on incidence exist, probably one out of five pregnant patients has varicose veins. They usually do not persist after the first pregnancy, but they almost invariably have become well established by the third pregnancy.

Certain physiologic changes during pregnancy directly affect the venous function of the lower extremity and must be appreciated for a proper understanding of this condition. The total blood volume increases during pregnancy. The blood volume and flow in the pelvis are markedly increased as the uterus grows and the placenta and its numerous arteriovenous communications develop. The growing uterus causes mechanical pressure on the iliac veins and thus gives rise to increased venous pressure in the lower extremities, as was shown by Burwell.[1] McLennan[2] made similar observations. They found that this increased pressure in the femoral veins returned promptly to normal after delivery. Veal and Hussey[3] noted increased pressure in the popliteal vein during exercise in pregnant patients. The venous flow from foot to groin slows down during pregnancy, as was demonstrated by Wright and coworkers[4] in a study using radioactive sodium. The increased blood flow in the pelvis secondarily impairs the return flow through the femoral veins and thus also contributes to the venous congestion in the lower limbs. The role of hormones in causing vasodilatation during pregnancy may be another factor, though not clear or proved. As a result of these physiologic changes associated with pregnancy, a state of diffuse dilatation and distention of all superficial veins in the lower extremity exists during pregnancy, but this state usually terminates at delivery.

In a patient with inherent susceptibility for varicosis, the distended veins may not return to normal size after delivery but instead may remain

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permanently dilated and incompetent. With each succeeding pregnancy the breakdown becomes more and more extensive, involving more and more superficial veins. During pregnancy, not only are the greater or lesser saphenous systems involved, but frequently also the venous networks in the vulvar and perineal regions are affected. In early pregnancy, scattered clusters of bluish venules, so-called angiectids, are often seen distributed over the thighs and legs. Some authors have attributed them to the influence of hormones, though it seems more likely that they are due to the over-all venous congestion in the lower limbs.

Management

The most effective treatment for varicose veins is complete surgical removal of all incompetent veins and perforators by stripping, dissection and resection.[5] A recent comparative study of results from this institution supports the conviction that the ligation and injection method fails to produce as satisfactory long-term results as does complete stripping.[6] However, this extensive operation is avoided purposely in the pregnant patient until after delivery, when it can be done more thoroughly and safely.

The operation of complete stripping of the veins has to be extensive by necessity, and therefore requires several hours of general anesthesia. The congestion of the superficial veins during pregnancy increases the tendency for bleeding during the operation, and even with the most careful hemostasis it is difficult to keep blood loss minimal; any loss of course only adds to the secondary anemia the patient often has. Furthermore, the venous pattern is abnormal because of the congestion, and it may be difficult to distinguish between temporarily distended veins and permanently varicose veins. Thus, the pregnant woman is not an ideal candidate for this time-consuming, elective operation. Instead, it is preferable to postpone the operation until approximately six weeks after delivery, when pelvic anatomy has returned to normal and pelvic congestion has completely subsided. By doing the operation then, discomfort and possible complications such as superficial phlebitis, stasis changes of the skin and continued breakdown of the tributaries will be prevented or minimized during subsequent pregnancies.

The varicose veins of the pregnant patient are managed conservatively with adequate elastic support and periodic elevation of the legs. Elastic support helps prevent swelling of the ankles and distention of the superficial veins, while elevation of the legs helps lower the hydrostatic pressure in the veins. With mild varices, elastic stockings are sufficient support, but with severe varices, elastic bandages (4-inch No. 8 Ace bandages) are more effective, wrapped from foot level and extending upward to compress the leg and thigh. If induration, usually due to superficial phlebitis, cellulitis or stasis, is present, additional elastic compression with foam-rubber pads is very effective. These pads are made from ½-inch foam rubber; the edges are properly beveled, and then the pads are covered with gauze and applied over the indurated areas. When distended and painful vulvar varices are present, local compression with a perineal pad and binder is advisable in addition to frequent rest in bed for symptomatic relief.

For superficial phlebitis, which is a most common complication, especially in the immediate postpartum period, locally applied heat and elastic compression are usually sufficient. Anticoagulant therapy has not been found necessary except in the very rare instance in which thrombosis has threatened to extend into the femoral or popliteal veins. Superficial thrombosed veins are not ligated, as the phlebitis usually subsides satisfactorily with conservative treatment. Stasis dermatitis, an infrequent complication, is treated with antipruritic lotions or wet dressings, in addition to adequate elastic support of the leg when the patient is up. Rupture with bleeding of a small superficial vein is a rare complication. Local pressure and injection of the responsible venule with sclerosing solution are effective measures. Injection therapy during pregnancy is otherwise not used. In essence, a conservative policy is followed until after pregnancy, when all varicose veins can be removed thoroughly by surgical means.

Summary

Varicose veins during pregnancy are managed conservatively with adequate elastic support until after delivery, when a complete stripping operation can be thoroughly and safely performed. This extensive, elective surgical procedure is done preferably when the patient is not pregnant, because a major surgical procedure should not be done upon a pregnant patient except as an emergency.

(References are on page 484)

Massive Bleeding in Diverticular Disease of the Colon

Report of Two Cases

• *Diverticular disease of the colon accounts for an occasional instance of massive melena. Two illustrative cases are presented with an informative discussion of incidence, pathology and therapeutic course of action.*

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THE purpose of this paper is to present a case of massive hemorrhage due to diverticular disease of the colon successfully treated by an emergency colectomy. A second case is briefly presented to illustrate an elective resection for massive bleeding in a hypertensive elderly patient.

Report of Cases

Mr. T. S., aged sixty-three, was first hospitalized in 1954 for gross rectal bleeding. One thousand five hundred cc. of blood was administered to restore his blood volume. Proctoscopic examination to 20 cm. was negative. Barium enema revealed diverticulosis involving the entire colon. He was well until October, 1957, at which time he was readmitted following massive rectal hemorrhage and lower abdominal discomfort. The hemoglobin was 9.3 gm. with 31 per cent hematocrit. One thousand cc. of blood was given. A repeat proctoscopic examination was negative, and a barium enema and air contrast study also negative except for diverticulosis. No further symptoms occurred until March 31, 1958, at which time he fainted in the bathroom following the passage of large amounts of fresh blood by rectum.

On the third admission, the patient was clinically in oligemic shock, with a blood pressure of 86/64 mm. Hg. General physical examination was otherwise negative. The hemoglobin was 11.6 gm. and hematocrit 34 per cent. One thousand cc. of blood was administered rapidly with a blood pressure response of 132/70. The patient continued to pass small amounts of blood clots until fourteen hours after admission, at which time a bloody diarrhea started with each stool measuring 200 to 600 cc. of blood. An attempt at proctoscopy was unsuccessful because of the massive bleeding. Following the administration of 3500 cc. of blood (blood pressure being well maintained), it was obvious that surgical intervention was mandatory. Thus, twenty-seven hours after admission, the abdomen was opened through a generous left paramedian incision. The entire colon was distended with blood. Careful examination of stomach, duodenum and small bowel was negative except for the distal 18 in. of the ileum which contained blood. Palpation of the entire colon revealed no lesions or inflammatory changes, other than diverticula of the entire colon. Because of the marked distention of the colon with blood, I did not feel that colonoscopy would be diagnostic. In view of extensive diverticulosis, a decision was made to do a colectomy and ileoproctostomy. After the resection, a sterile proctoscope was passed distally into the rectum to rule out any site of bleeding from the stump. It should be noted that extreme care was taken to preserve the terminal-most portion of the ileum to preserve maximum absorptive mucosa. Two thousand cc. of blood was administered during the operation. An immediate postoperative blood volume (Evan's blue dye) measured 5160 cc. with an expected total blood volume for his surface area of 5400 cc., with a red cell mass of 2530 cc. and an expected red cell mass of 2580 cc. The patient tolerated the operation very well.

The colon contained 1100 cc. of fresh blood and clots. Grossly, diverticula were present throughout the specimen, being most marked in the sigmoid colon. A small ulcer with an adherent blood clot was found within a diverticulum in the mid-transverse colon. Microscopic sections showed a sharply pitted ulcer, the crater of which was filled with a hyaline mass of blood and fibrin.

A mid-wound separation, without evisceration, was closed under local anesthesia, on the fifth postoperative day. A marked ileus followed and was treated using a long tube. The patient developed mental confusion and irritability after two weeks of nasal suction. Repeated electrolyte studies (sodium, potassium, chloride, CO_2) remained within normal limits. Oral feedings were started on the fifteenth postoperative day and about that time the patient was found to have a positive Chvostek's sign. Following the administration of intravenous calcium gluconate and oral Nilevar, he rapidly improved with discharge on the twenty-fourth postoperative day. Since discharge, the patient has gained 15 pounds of weight and has one or two solid to semi-solid stools per day.

Mrs. M. A., aged seventy-four, was hospitalized on May 24, 1958, following a ten-hour history of profuse rectal bleeding. On admission, she also had clinical evidence of oligemic shock. One thousand cc. of blood was given rapidly after which the patient had no more

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bleeding and her blood pressure (210/110) was well maintained. During the next several days she complained of epigastric distress plus nausea. Prior to admission, vomiting without hematemesis occurred. She gave a ten-year history of periodic rectal bleeding which she related to hemorrhoids. An upper gastrointestinal series was normal. A barium enema showed marked diverticulosis of the left colon, especially in the sigmoid. Proctoscopic examination three days after admission was negative. On June 5, 1958, a left colon resection was done. Careful examination of the intestinal tract was otherwise normal. The gross specimen revealed only extensive diverticulosis. Microscopically, no ulcerations were found. Her postoperative course was uneventful.

Massive bleeding is a well-recognized but rare complication from diverticular disease of the colon. Bleeding—either occult, mild, or moderate—however, is more common and thus diverticular disease must be included in the differential diagnosis of melena.

Only a small number of reported cases of massive hemorrhage are found in the literature. Mobley and Dockerty[1] reviewed 1470 cases of diverticulitis at the Mayo Clinic between 1940 and 1954. Only one patient had severe hemorrhage; nineteen had moderately severe and twelve had mild bleeding. Noer[2] reviewed the literature from 1942 to 1955 and found forty cases with sudden severe hemorrhage reported in eighteen publications. LeRoyer[3] studied 200 cases of diverticulitis and of that group, 16.5 per cent had melena. In six patients, rectal bleeding was the main complaint but only one required transfusions. Hoar[4] studied 289 cases of diverticulosis and diverticulitis out of which fourteen patients had massive hemorrhage. Two patients required surgical procedures in an attempt to save life. Fallis[5] reported on ninety-four cases of diverticulitis and found twenty-nine patients (41 per cent) with melena; two of these required resection. Of seventy-eight patients hospitalized, because of complications from diverticular disease of the colon, Quinn[6] found thirty-seven (48.7 per cent) were admitted primarily because of hemorrhage. In twenty-three patients (62 per cent), hemorrhage was considered as massive and total colectomy was done as an emergency in two. Rosser[7] noted bleeding in 30 per cent of forty cases of diverticulitis, four of which had spontaneous and massive hemorrhage. Of thirty-five patients resected for diverticulitis of the sigmoid, Boyden[8] stated that hemorrhage occurred in four (11.8 per cent), with hemorrhage being the presenting symptom in three. Knight[9] reported on 289 patients with diverticular disease of the colon. Fifty-six patients (19 per cent) had no other cause for gross rectal bleeding and, of that group, fourteen patients had massive bleeding. Only two patients required emergency colectomy. Turnbull[10] stated that massive hemorrhage occurred in nine of 151 patients (6 per cent) admitted for diverticular disease of the colon. Welch[11] reported on 582 patients observed for diverticulitis of the sigmoid. Out of 114 resections, bleeding was the major indication in five, three of which had massive hemorrhage with one patient requiring a total colectomy because of shock. Brock and Cates[12] each published case reports where emergency colectomy with ileo-sigmoidostomy was done for massive bleeding. Kunath[13] reported on three cases of massive bleeding in which emergency transverse colostomy was done in two, and conservative treatment in one.

Scarborough[14] and DeCosse[15] have emphasized that in patients with diverticular disease who have rectal bleeding, persistent examination (sigmoidoscopic, barium and air contrast studies) must be done to rule out all other sources of melena. In eighty-nine cases observed for one year by Scarborough for rectal bleeding where diverticulosis or diverticulitis had been accepted as the cause, an adenoma or malignant lesion was found in each case after repeated studies. In this same period, sixteen patients were proved to have bleeding from diverticulitis with no emergency resection for bleeding being necessary. DeCosse's experience was similar, and he states: "Our data indicates that diverticulitis is seldom the cause of rectal bleeding and that other sources of the bleeding are likely to be disclosed by intensive study of the patient."

Pathology

In a high percentage of cases where massive bleeding occurs, diverticula involve the major portion, if not all, of the colon.[2,9,12,13,16,17] The exact point of bleeding is not always found. Mobley and Dockerty[1] carefully studied thirty-two resected specimens grossly and microscopically where bleeding had occurred. In ten cases, ulcers were found to be present in one or more diverticula. In eleven cases, gross inspection revealed an ulceration or discolored zone in the mucosa. Isolated case studies likewise have demonstrated ulcerations within diverticula.[17] By injection studies, Noer[2] found an

increased concentration of blood vessels about colonic diverticula.

Active diverticulitis is not always present,[9] although the Mayo Clinic group[1] found diverticulitis to be present in all. It is difficult to accept the pathogenesis of moderate or massive bleeding without ulcerative changes. In the future, more careful gross and microscopic studies may disclose more cases with definite ulcers in the diverticula.

Treatment

Emergency surgery for massive bleeding in diverticular disease is seldom indicated. The majority of patients respond to conservative treatment with initial blood volume replacement, rest and diet.[3,6,18-20] However, when it becomes evident that massive bleeding continues, the type of surgical treatment is not clear. Transverse colostomy,[4,9,13,16] sigmoid resection[4,5] (primary or Mikulicz resection), exploratory laparotomy without definitive procedure,[2,6] ileostomy,[21] and colon resection with ileo-sigmoidostomy[6,7,11,12,22] have all been utilized. Extensive resection in the presence of advanced age, frequently associated hypertension,[18] plus massive hemorrhage, all contribute to a surgical challenge.

What steps can be utilized to arrive at a decision? A preoperative barium enema may localize the diverticular disease to the sigmoid and thus a primary sigmoid resection or an exteriorization can be done. If only the left colon is involved, a transverse colostomy can be utilized if the condition of the patient contraindicates resection. If the entire colon is involved with extensive diverticulosis, a colectomy with ileoproctostomy must strongly be considered. Preoperative and postoperative blood volume studies, along with careful blood loss replacement during surgery, decrease the operative risk. Colotomy and colonoscopy in the presence of an unprepared colon, which is distended with blood, has been found to be of little value in the localization of the site of bleeding.[9] Obviously, a careful gross examination of the entire gastrointestinal tract at the time of surgery is mandatory.

In the recent literature, many writers[11,23-26] tend toward a more aggressive surgical approach in diverticular disease of the colon.

Summary

Massive rectal bleeding, although rare, is a complication of diverticular disease of the colon which may require emergency surgery to save life. In a brief review of the literature, the incidence of some type of bleeding from this disease is variable. In the reported cases of massive bleeding, it occurs most commonly after the age of sixty; repeated episodes of bleeding may or may not occur; hypertension is frequently present; and the diverticula commonly involve the major portion of the colon. The site of bleeding has not always been demonstrated; however, microscopic and macroscopic ulcers have been demonstrated in the diverticula. In non-emergent cases with bleeding, intensive study of the patient must be done to rule out other causes. In the rare case of persistent massive bleeding, the choice of operation must be individualized.

Two cases of massive hemorrhage are reported, one of which required emergency resection to save life and the other was resected electively to prevent a recurrence of bleeding in a patient who possibly could not withstand another massive bleeding episode.

References

1. Mobley, J. E., Dockerty, M. B., and Waugh, J. M.: Bleeding in colonic diverticulitis. Collected Papers of the Mayo Clinic, 48:72, 1957.
2. Noer, R. J.: Hemorrhage as a complication of diverticulitis. Ann. Surg., 141:674, 1955.
3. LeRoyer, C. P., Jr., and White, B. V.: Diagnostic and therapeutic problems in diverticulitis. New England J. Med., 239:245, 1948.
4. Hoar, C. S., and Bernhard, W. F.: Colonic bleeding and diverticular disease of the colon. Surg. Gynec. & Obst., 99:101, 1954.
5. Fallis, L. S., and Marshall, M. R.: Acute diverticulitis of the large bowel. Am. J. Surg., 80:198, 1950.
6. Quinn, W. C., and Ochsner, A.: Bleeding as a complication of diverticulosis or diverticulitis of the colon. Am. Surg., 19:397, 1953.
7. Rosser, C.: Surgical management of diverticulitis. South. M. J., 32:1203, 1939.
8. Boyden, A. M.: The surgical treatment of diverticulitis of the colon. Ann. Surg., 132:94, 1950.
9. Knight, C. D.: Massive hemorrhage from diverticular disease of colon. Surgery, 42:853 (Nov.) 1957.
10. Turnbull, G. C.: Massive hemorrhage from diverticula of the colon. Report of 12 patients. Quart. Bull. Northwestern Univ. M. School, 22:292, 1948.
11. Welch, C. E., Allen, A. W., and Donaldson, G. A.: An appraisal of resection of the colon for diverticulitis of the sigmoid. Ann. Surg., 139:332, 1953.

(Continued on Page 472)

A Clinical Evaluation of the Transaminase Test

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THE purposes of this clinical laboratory investigation were: (1) to determine the diagnostic accuracy of the analysis of serum glutamic oxalacetic transaminase (S.G.O.T.); (2) to compare this test with the electrocardiogram interpretation, the white blood cell count and the red blood cell sedimentation rate in patients with a clinical diagnosis of myocardial infarction; (3) to learn whether the test was being used for some of the less commonly known and useful diagnostic measures in diseases outside of the heart; and (4) to determine if it is desirable to encourage the use of the test in smaller hospitals where it has not yet been tried. This is an interval report on a continuing study.

The transaminase test appears to be unanimously accepted in the larger medical centers along with the electrocardiogram as a valuable laboratory procedure for the detection of myomalacia cordis. A widely used practically accurate and dependable colormetric procedure which can be performed with reliability in some of the smallest laboratories is available through the use of a commercially prepared kit of standards, reagents and directions.*

A common fear of an insufficient usage of a newly established test in smaller institutions should be weighed against the fact that coronary sclerosis and its complications is now among the most common and most serious diseases leading to admission to hospitals. In our experience, 750 analyses of S.G.O.T. (at $5.00 a procedure) were run in the first year of its introduction in this hospital.

Glutamic oxalacetic transaminase is said to be an intracellular enzyme which catalizes the conversion of the two animo acids, aspartic acid and glutamic acid from one to the other. The diagnostic value of the measurement of transaminase in the serum lies in the fact that necrosis of cells in the heart, liver, pancreas and striated muscle will lead to a release of this enzyme into the blood stream. The small amount of transaminase normally in the serum (up to 40 units) will increase above 50 units because of the extremely high concentration released from relatively few cells involved in the necrotizing or badly injuring processes in these organs. The ratio of G.O.T. in heart muscle as compared to that in the serum has been calculated to be 10,000[7]/1. The test can be run without regard to the time of day or relationship to meals. The enzyme in serum is for most practical purposes stable. There have been many good and useful contributions to the medical literature on the value of transaminase measurements. It is not the purpose of this presentation to attempt even a superficial coverage of these references.

Method and Procedure

The hospital charts of 100 consecutive patients upon whom an analysis for serum transaminase was performed at least once (average 2.25 per patient) were reviewed in detail to obtain the laboratory data and clinical diagnoses. The transaminase test was performed by a fully qualified chemist or medical technologist, using the colormetric procedure cited in the foregoing.

Results

The clinical diagnoses of the 100 patients' records studied can be divided into eighty-nine with complications of arteriosclerosis of the coronary arteries and eleven with miscellaneous disease processes outside of the heart. Of the former group, there were forty patients with a clinical diagnosis of coronary thrombosis and infarction, twelve with questionable thrombosis and infarction, twenty-six with coronary insufficiency (nearly all of whom

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*Sigma Chemical Company, 3500 De Kalb Street, St. Louis 18, Missouri.

had a clinical history of coronary disease on previous occlusions) and eleven patients with long-standing cardiac problems with attendant emotional disturbances or conditions not related to pregression of their heart disease.

TABLE I. CORONARY THROMBOSIS AND MYOCARDIAL INFARCTION
(40 Patients)

Test	Positive	Questionable	Negative
S.G.O.T.	28	2	10
E.C.G.	29	11	0*
R.B.C. Sed. Rate (15 mm.—Westgren)	38		2
W.B.C. CT. 12,000	23		17

*Isolated negative tracings in E.C.G. tracings of five patients.

A summary of the findings in the charts of the first group of forty patients clinically diagnosed as coronary artery thrombosis and myocardial infarction or simply myocardial infarction will be found in Table I. In relation to the S.G.O.T. or the transaminase test, "positive" means values above 50 units, "questionable" those between 40 and 50 units and "negative" up to 40 units. In twenty-eight of these forty cases, the test was interpreted to indicate cardiac necrosis. A further study of the ten patients with normal (negative) S.G.O.T. in this group revealed that a single test was run too early or before twenty-four hours after the hour of onset of symptoms in three instances and it was performed too late (after five days) on five patients. In two cases the diagnosis was disputed by consultants and in two other patients a post mortem examination did not reveal myomalacia cordis although the test had been positive.

All forty patients of this group had abnormal, generally multiple, electrocardiogram tests (using twelve leads) while isolated normal sets of tracings were found in five of these patients. In twenty-nine instances, the E.C.G. study was considered diagnostic of myocardial infarction. There were eleven patients with abnormalities in their tracings but not diagnostic of infarction.

The data on the charts of twelve patients with a final diagnosis of questionable thrombosis and infarction are found summarized in Table II. The very important group of twenty-five patients interpreted as having coronary insufficiency (no myocardial necrosis) are condensed in Table III. See Table IV for the findings in the group of twenty-five patients with clinically established coronary disease who were admitted without symptoms of heart disease, other than emotional disturbances. The patients with clinical diagnoses dependent on diseases completely removed from the heart are found on Table V.

Discussion

The validity of this study depends upon the accuracy of the clinical diagnoses. The great majority of the patients had an internist in attendance. Using all of the written recordings the author (pathologist) agreed with the clinical diagnosis in all but a very few cases. The physicians of the patients in this study almost certainly used all clinical manifestations and the laboratory data to arrive at their final diagnoses. For this reason the study cannot logically be used to compare the accuracy of clinical observations with that of laboratory findings, but it does enhance the value of the final diagnosis in lieu of an autopsy. There have not been sufficient numbers of necropsies on patients with estimations of S.G.O.T. in this hospital to date for a satisfactory analysis of the value of the test.

TABLE II. QUESTIONABLE THROMBOSIS AND INFARCTION
(12 Patients)

Test	Positive	Questionable	Negative
S.G.O.T.	4	3	5
E.C.G.	2	8	2
R.B.C. Sed. Rate (15 mm.—Westgren)	11		1
W.B.C.—Ct. 12,000	3		9

Summary and Conclusions

1. This is a clinical evaluation of the transaminase test using the data from the charts of 100 consecutive hospital patients upon whom at least one analysis of serum glutamic oxalacetic transaminase was performed.

2. Within the limits of error of this study, which is directly related to the accuracy of the clinician's final diagnosis, it was found that the test is the best laboratory procedure for the detection of myomalacia cordis ranking with the electrocardiogram as a diagnostic aid.

3. Of the forty patients who were diagnosed clinically as myocardial infarction there were ten who had a single S.G.O.T. test which was in the normal range. Eight of these tests were run either too early or too late for satisfactory results. Twenty-eight of this group of forty patients had posi-

tive tests which were considered indicative of myocardial necrosis.

4. The transaminase test was negative in a satisfactory number of patients without clinically apparent heart muscle necrosis. The two positive and two questionable results in the group of twenty-six patients clinically diagnosed as coronary insufficiency might well be expected and might shed some doubt on these four clinical interpretations.

5. The four elevations of S.G.O.T. in the eleven patients of the miscellaneous (noncardiac) disease group occurred in patients with choledolithiasis, acute pancreatitis and pneumonia with empyemia

TABLE III. CORONARY INSUFFICIENCY
(26 Patients)

Test	Positive	Questionable	Negative
S.G.O.T.	2	2	22
E.C.G.	0	25	1
R.B.C. Sed. Rate (15 mm.—Westgren)	18		8
W.B.C. 12,000	4		22

and septicemia, all conditions known to produce positive tests.

6. Repeat or "serial" transaminase tests and E.C.G. tests have many advantages. Repeat if the first enzyme test is run within the first twenty-four hours and is negative or if there is any prospect of liver or pancreatic disease, where the elevation remains high after the five days characteristic of myocardial necrosis. In most situations, if for some reason only one test is to be run on a patient with possible myocardial infarction, it should be ordered for from twenty-four to forty-eight hours after the onset of symptoms. Before or after this period, the test may give a false-negative result. However, it is frequently positive within six hours of onset.

7. Based on the apparent fact that "transaminase" is released to the blood stream as the result of cell necrosis with few well-known exceptions (including some cardiac arrhythmias and liver conditions), the test must be considered specific for cell necrosis when compared to the red blood cell sedimentation rate, white blood cell count, C-reactive protein and other less frequently used tests whose results can be and are frequently elevated by a great variety of conditions besides cell necrosis. The non-specificity of the latter tests is borne out by finding an increase of the red blood sedimentation rate in eighteen of the twenty-six patients with coronary insufficiency (no necrosis) and eleven of the twelve patients having questionable thrombosis with infarction (Tables II and III). The white blood cell count was found elevated in seventeen of the forty patients with myocardial infarction (Table I). These tests should be interpreted with great care in cardiac seizures occurring after the first infarction.

TABLE IV. CORONARY DISEASE—EMOTIONAL AND NON-CARDIAC SYMPTOMS
(11 Patients)

Test	Positive	Questionable	Negative
S.G.O.T.	0	0	11
E.C.G.	0	11	0

TABLE V. MISCELLANEOUS DIAGNOSES

Disease	S.G.O.T.	E.C.G.
1. Rheumatic fever and mitral disease	Normal	Normal
2. Compression fracture spine	Normal	Normal
3. Acute esophagitis and gastritis	Normal	Normal
4. Hepatitis(?)	Normal	0
5. Possible dissecting aneurysm	Normal	Abnormal
6. Non-union patella	Normal	Abnormal
7. Pneumonia, empyemia, septicemia	54	Abnormal
8. Cholelithiasis	Normal	Abnormal
9. Acute pancreatitis	260	0
10. Choledolithiasis	180	Abnormal
11. Choledolithiasis	260	Abnormal

8. The S.G.O.T. and E.C.G. tests complement each other and, in most situations, should not be used to exclude one or the other. Each provides a means of specifically diagnosing myocardial infarction with a high degree of accuracy when used with clinical observations.

9. The S.G.O.T. test appears to be particularly valuable in those patients suspected of having complications involving arteriosclerosis of coronary arteries in which the E.C.G. is interpretated as abnormal but not specific evidence for infarction of the myocardium (Tables II and III).

10. The study reveals an almost exclusive use of the transaminase test in this hospital as a means of detecting cardiac disease. There has been confirmed evidence that it is useful for the clinical investigation of active rheumatic carditis, occult hepatitis, other liver diseases—including even small numbers of cases exhibiting cancer metastases to the liver, acute pancreatitis, pulmonary infarcts, pulmonary emboli and in cerebral infarction, if after five days from the onset of the symptoms the spinal fluid is used for the test.

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• *An informative discussion of peripheral nerve injuries with emphasis on the use of electrodiagnostic testing and electromyography.*

The Physical Treatment of Peripheral Nerve Injuries

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DURING World War II and since, there has been an awakening to the care of peripheral nerve injuries. The increase in accident rates of all types since the war has provided more and more cases of peripheral nerve injuries. Granting that safety measures for the prevention of such injuries is the number one industrial and medical problem, the fact remains that the patient with a peripheral nerve injury must be treated.

This discussion does not cover injuries requiring immediate surgical attention but will concern those cases in which some time has elapsed after the emergent care has been accomplished. Thus, little of what is to be said here can help the surgeon who must use his every skill, many times within the first six hours, to save life and limb. He cannot wait for complete degeneration of a nerve to occur before proceeding. His judgment and knowledge must be put to immediate use.

The diagnosis of the injury and its severity is the first thing to be determined. Mild compression, ischemia, stretching and concussion from explosions may injure nerve fibers. Henderson and Traverner[1] have pointed out that the larger diameter nerve fibers suffer damage of this type more easily than do the smaller diameter fibers. Since the majority of these larger diameter fibers innervate voluntary muscle, a paralysis is generally more severe than the sensory loss in the area since the sensory fibers are most generally smaller in diameter. This is a valuable clue to prognosis for it may indicate functional loss of continuity of the nerve fiber rather than dissolution.

In the process of degeneration and regeneration, it is known that when the axons only (not the sheaths) are interrupted, the regenerating nerve fiber finds its proper channel for regrowth. Reneurotization can be expected to be 100 per cent. If the sheaths are separated, but in immediate proximity, the regenerating fibers will locate their distal channels in a large percentage of cases. If, on the other hand, separation of the distal and proximal ends occurs only surgical intervention will bring about proper apposition.

It has been demonstrated that such surgery will allow the regenerating fibers to find sheaths and

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regardless of the previous function of the nerve fiber of that sheath, the new growing fiber will assume the former function if it properly grows to the end organ—be it sensory or motor. Even a motor fiber growing down the channel of a sympathetic nerve will, on maturation, develop a myelin sheath. It must, however, be remembered that this intermixing of the fibers leads to central cerebral impressions which may be confusing. For the sensory cortex may now be connected to a motor end plate by its accustomed usage. This cortical confusion may retard, delay or completely inhibit fine coordinated movements of the fingers, for example, which require delicate sensory impressions followed by complicated muscular responses to effect neuromuscular coordination.

Generally speaking, however, it may be said that the degree of sensory loss in a mixed-nerve injury will not ever be as severe as the motor loss and can indicate somewhat the degree of nerve injury.

Nothing replaces a good history of the injury (if it can be obtained) and the careful physical examination. If loss of voluntary motion is evident on physical examination, it remains only to determine the severity and level of the lesion to outline the course of treatment and determine the prognosis. For help in making these determinations, certain electrical tests have been described.

About 1862, Erb described the first of these tests which now bears his name. It simply involved the application of faradic current to the paralyzed muscle area. If there was a response to faradic stimulation, the nerve to the muscle was still intact. If there was no response, galvanic stimulation was attempted and if the muscle responded, it meant that the nerve was degenerated.

In the instance of faradic current, the nerve only would respond. This has since been shown to be due to the physiologic fact that the irritability of nerve has a threshold which will respond to currents of relatively high voltage and short duration, while muscle will not. The exception is that very high voltage of short duration will stimulate muscle. Generally, the patient cannot tolerate such high voltage if any sensory nerves are intact. Therefore, if induced (faradic) current is applied and a response is evident, the nerve is intact. A known normal area (often the other limb) can be tested to determine the approximate strength of faradic current which will stimulate a normal nerve.

Muscle also is an irritable tissue and if an unidirectional current is applied for a sufficient period of time, the muscle will respond even if it is not innervated. If, however, fibrosis has set in, the muscle will not respond. The response of denervated muscle is not the quick, rapid twitch seen by normal muscle but rather a slow worm-like contraction, which does not relax completely until the current is turned off. This test has been called the "reaction of degeneration" or R.D.

Erb's test is of little prognostic significance because voluntary contractions will be visible some time before irritability to faradic stimulation returns. It should also be noted that because of the physiologic reactions to the denervating process—namely, that a degenerating fiber can conduct and that its motor end plate may be hypersensitive during degeneration, a period must elapse before diagnostic testing can be of any value. This applies to any electrodiagnostic testing. The time lag varies with the length of fiber involved in the degenerative process, but it is generally shown to be about two to three weeks.

During World War II, the incidence of war casualties created a renewed interest in the field of electrodiagnostic testing. With electronic instruments, currents of accurately measured amperages and times could be easily made. Under Pollock and his associates[2] at Northwestern University and Mayfield at Percy Jones Hospital, Battle Creek, Michigan, a series of electrodiagnostic tests was devised. These tests not only offered the earliest possible positive diagnosis but when repeated on the patients at regular intervals were found to have certain values in predicting early reneurotization of the muscles.

The tests, as finally used routinely, involved (1) a strength-duration curve which yielded, automatically, a rheobase and a chronaxie, (2) a reversal of cathode and anode in determining the rheobase, and (3) measuring the cathodal current necessary to produce a tetanus. From the latter two tests, ratios could be evolved and are called the rheobase ratio and the cathodal tetanus ratio.

Progressive determinations of these tests afforded the ability to differentiate between degenerating, degenerated and regenerating nerves. These investigators were able to predict six to eight weeks in advance that muscle function would return. They were also able to determine, at an early date, need for surgical intervention. However, they were not

able to determine the quantitative recovery that might result.

During and immediately after World War II, a new method of diagnosis was evolved. Instead of stimulating with an electric current and observing responses, electrodes were placed on the skin over the muscle or a concentric needle was inserted directly into the muscle and minute action potentials were obtained. This required equipment—including a cathode ray oscilloscope, an amplifier of high fidelity and a method of recording. The action potentials are of the magnitude of 1/1,000,000 volts compared to electrocardiography whose action potentials are of the magnitude of 1/1000 volts. The duration of these action potentials are measured in milliseconds. This apparatus is known as an electromyograph and the diagnostic procedure as electromyography.

With this equipment, it is possible to make a more minute diagnosis of the number of motor units denervated but probably more important, it can prognosticate recovery several months before regeneration is evidenced by voluntary contractions.

The expense of the equipment and the elaborate techinque involved have limited the everyday use of this type of testing to university centers or in areas of specialized concentration on large numbers of patients having neurologic problems.

Electrodiagnostic testing is a laboratory aid to the clinician and not a substitute for a good physical examination and a careful history. It cannot hasten the recovery of the patient nor prevent the degenerating process with its resultant muscle atrophy; only careful supervision and treatment of the patient can bring about the best possible result. As already indicated, the intervention of surgery at the earliest possible moment can assist in earlier recovery which, at best, is going to be very prolonged.

Different diameter nerve fibers regenerate at different rates—the largest growing perhaps as much as 3 mm. per day and the smallest at a rate of less than 1 mm. per day. If the site of the lesion is known and the distance measured to the most distal point supplied by that nerve, an estimate can be made of the expected lapse period before early signs of voluntary motion appear.

The Hoffman-Tinel sign is a useful clinical procedure in following the course of nerve regeneration. By tapping lightly with a single finger over the course of the degenerated nerve, a tingling sensation is set up over the peripheral course of the nerve. As the nerve regenerates, the point of eliciting such a sensation follows the growth and if a record of the growth is kept, one can predict its rate and progress. Napier[3] claims the sign should not be considered irrefutably positive until it can be elicited 10 cm. or more distal to the site of the injury.

General Treatment

As mentioned previously, when the cause of the nerve injury is trauma, such as avulsions, lacerations or crushing injuries, necessitating immediate surgery, time is of the critical essence. The surgeon must use his every skill to restore functional anatomy as nearly as is possible and will find little of value in the material just discussed.

Following surgery to tendons and nerves, the parts are immobilized to keep tension off the delicate sutures. After immobilization, there must be extreme caution in the treatment instituted and parts distal to the sutures must be handled gingerly. As healing takes place without complication, the treatment can be carried out as indicated hereafter.

There is a difference of opinion on the most important part of the treatment. The English school as expressed by Sandifer[4] claims that maintaining range of motion in the joints distal to the injury is most important. If periarticular changes occur which result in loss of passive range of motion, then the weakened recovering muscles will never be of any use in moving the part even if they recover full strength.

In this country, functional splinting is considered at least as important as passive motion (Watkins[5] and Rusk[6]). This does not mean continuous protection; such protection leads to muscle and bone atrophy, as well as to contractures and fibrosis. The splints are removed several times a day for other treatment including passive range-of-motion exercise.

It is often a standard practice to precede the above treatment with heat. Because of the frequent loss of sensation, the use of any form of diathermy is contraindicated as a method of heating. Diathermy output cannot be safely administered in the face of sensory loss. Luminous or non-luminous forms of infrared can be used provided the source of energy is kept far enough away from the part to prevent burning. For extremities, a useful form of heat is water commonly used as whirlpool. Here the temperature of the water can be measured

beforehand with a thermometer. The water should not exceed 100 to 101° F. The use of air ejection agitators provides a small degree of passive motion to the distal immersed parts. The heat is used to increase the circulation and to relax the muscles.

Following the heat, a routine gentle passive motion is used at each joint carefully taking it through its normal range of motion. Force is not necessary and may be harmful in over-stretching shortened paralyzed muscles. With muscle atrophy, the relaxation which may accompany the disorder may lead to excessive lengthening of the tendons and the stronger antagonist may become shortened. If the normal status of the muscle is one of weakness, such as the extensors of the wrist and fingers or the dorsiflexors of the foot and toe extensors, then the stronger antagonist may produce a virtual physiologic contracture which will be extremely difficult to overcome even if recovery should become complete. Even the force of gravity exhibited in wrist drop or foot drop, can be sufficient to produce irreversible damage. This is a leading reason for the philosophy of functional splinting-stretch and keeping stretched the stronger muscles while awaiting the return of muscle power to the paralyzed muscle.

The question of the electrical stimulation of paralyzed muscles has advocates and critics. Clinical and physiologic evidence are difficult to evaluate. Fischer[7,8] and Wakim[9] have demonstrated that there is a delay in muscle atrophy if stimulation is used, but at best, over a long period of awaiting recovery, not over 50 per cent can be prevented. This is based on wet and dry weight comparisons of stimulated and non-stimulated denervated muscle. They do believe, however, that there is a more rapid return to peak strength on recovery. This is not to be misconstrued to mean that a muscle which only becomes 50 per cent reinnervated will have the same strength as one which is 80 per cent reinnervated. They are agreed that electrical stimulation cannot alter in any way the rate of regeneration. It becomes a matter of maintaining more bulk and a faster rate of voluntary recovery. These are, of course, conclusions based on animal experiments.

The matter of what type of current to use and the frequency of stimulation periods must be mentioned. Grodins and his colleagues[10] claimed that a low frequency. (10 to 25 per sec.) slowly rising, alternating current produced the maximum contraction of the muscle with the lowest amperage. Others have used square or rectangular wave forms with and without alternating polarity and obtained equally satisfactory results. Their currents were based on the fact that galvanic tetanus could be produced at low amperages. On one point they all agree: that the contraction should be of a vigorous tetanic type to produce the best results.

Sandifer[4] advocates 100 contractions divided into three periods with at least three-minute rests between periods. In Wakim's[9] experiments, he used varying times and found little difference in their effectiveness. Agreement on daily stimulation seems to be accepted.

The problem of prevention of muscle fibrosis during the denervated state is one in which there is no immediate answer. Reports have been made that muscle denervated twenty years previously by poliomyelitis has sometimes been without fibrosis, while muscle denervated a mere six or eight weeks under the best medical supervision, including electrical stimulation, showed marked fibrosis. It could be that within the previous history of the muscle tissue might rest the explanation. In other words, a muscle which had seen much use and abuse over the years might more easily, during degeneration, regress to a state of fibrosis. There is no proof of this theory but it is being advanced in the field of geriatrics to explain wear and tear on tissues. Another factor may be the disturbed metabolism and blood supply to the muscle. If such were the case, the heat, motion and electrical stimulation should minimize or reduce the fibrosis. Again, there is little evidence to support such a proposition. One more factor might be tissue trophic changes due to altered enzyme mechanisms and the accompanying change in the "trigger mechanism" of acetylcholine at the muscle-nerve junction. The explanation may be found in one, a combination or none of these suggested theories.

The purpose of the treatment is to insure the best possible muscle when reneurotization takes place. Once the muscle can again be moved voluntarily, graded increases of exercise can be instituted as rapidly as they can be tolerated. At this time, occupational therapy is instituted for the disabled part. This occupational therapy should be of such a nature that the patient repeats over and over again, the muscle action necessary to build strength and neuromuscular co-ordination in the paralyzed muscles.

Since many nerve lesions take months for recovery, it has been a common practice to send patients to occupational therapy to learn the activities of daily living and self care while awaiting the return of innervation to the affected part. If there is a possibility that the injury will necessitate a change of occupation, thought should be given at the earliest possible time to vocational rehabilitation. The anticipated new occupation may require neuromuscular skills or education which could be given during the long recovery period.

Facial Nerve Paralysis

(Conduction Type Known as Bell's Palsy)

Facial nerve paralysis is the most frequent cranial nerve lesion for which physical medicine treatment is requested. In 75 per cent of all cases the cause is unknown. There is frequently a history of exposure to cold or trauma but this is not universal. It is thought by some that it is the result of edema followed by ischemia within the narrow canal of the petrous portion of the temporal bone. Other causes include basal skull fracture, infection of the mastoid air cells and surgery of the parotid gland.

The onset is often preceded by pain over the mastoid bone and perhaps tenderness over the insertion of the sternocleidomastoid muscle. Occasionally, an enlarged, tender lymph node may be found between the angle of the jaw and the mastoid.

All the affected muscles, including the platysma, are flaccid and toneless. They are unilateral making the face assymetric even at rest and because of gravity, they sag. Tears trickle over the lower margin of the eyelid and saliva drools from the corner of the mouth. The eyelid descends slightly because of reciprocal inhibition of the levator palpebrum and the orbit rolls up when the patient attempts to close his eyes. Attempted blowing or whistling cannot be accomplished because the cheeks cannot hold air. Drinking fluids results in trickling from the flaccid corner of the mouth and solid food tends to become lodged between the gums and cheek. Loss of taste from the anterior portion of the tongue and increased acuity of hearing with clicking noises may occur if the geniculate ganglion and the stapedius muscle are involved.

A review of 517 cases at Massachusetts General Hospital by Park and Watkins[11] showed 451 or 87.2 per cent to be of idiopathic origin; thirty-one or 6 per cent, traumatic; the same for infection; and, four cases, or 0.8 per cent due to tumor. One hundred and ten cases revealed some gustatory changes. The patients in 87 per cent of the idiopathic cases had a total loss of voluntary motion over the seventh nerve distribution, the other 13 per cent had partial loss.

Electrodiagnosis showed 35 per cent had partial R.D. while 52 per cent had normal reactions. Treatment consisted of luminous heat, or hot packs for twenty minutes, twice a day; light stroking massage; galvanic or faradic stimulation, three times per week; passive exercise until voluntary motion returned, two times a day; and care of the eye, twice a day. Results: 66 per cent, complete recovery; 21 per cent, good; 9 per cent, fair; 3 per cent, poor; and 1 per cent, no improvement. There was a 0.7 per cent recurrence. Patients with normal electrodiagnosis recovered in two to six weeks; partial R.D. patients averaged one month, occasionally two to six months; complete R.D. took three to four months for maximum recovery. Mass action of facial muscles—with distant muscles accompanying activity such as smiling and eye-closing, or stimulating a muscle and a remote muscle also contracting—were frequent accompanying findings.

The treatment follows the procedure set forth above. Stretching of the muscles by the intact muscles of the opposite side of the face, and the force of gravity can be helped by warning the patient about smiling or laughing excessively. Splints can be made from adhesive tape or plastic —the principle being one of trying to keep the angle of the mouth upward.

Since frequently the eye will not close, a patch or night shade can be worn during the sleeping hours, and glasses for protection of the conjunctiva and cornea should be worn during the waking hours.

There is frequent pain accompanying the early stages of facial nerve paralysis. The pain is located just behind the ear. Relief may be obtained by mild heat applied in the form of warm compresses or luminous heat.

The use of gentle stroking massage away from gravity, may help in producing passive exercise. When muscle again comes under voluntary control, the patient can be taught to exercise in front of a mirror. The exercises are usually taught bilaterally because they are easier to do and the cerebral patterns are geared to symmetric activity. These exercises are practiced many times a day until recovery reaches a maximum. While the patient strives for complete recovery, it is common

to have some degree of asymmetry accompanying speech or smiling. In the more severe cases, the mass action is more evident. The muscles become more irritable and electrical stimulation must be discontinued. There is often an onset of tic-like involuntary motions which are annoying. These may be gross fasciculations described in electromyography. Mild heat and gentle massage is given for relief. Emotional stress may make these complications more severe and reassurance and mental relaxation are necessary for mental poise.

Radial Nerve Injury

This is a common condition following resting on crutches (crutch paralysis), resting on a park bench (Saturday night palsy) and accompanying fractures of the humerus in the area where the radial nerve curves close around the humerus. Injuries of the brachial plexus posterior cord will give the most complete type of radial nerve injury. Most often the nerve is injured below the level at which the triceps muscle is supplied so that extension of the elbow is not affected. The resulting lesion affects the extensors of the wrist and fingers giving the well-known wrist drop. Sensory loss is confined to the radial side of the dorsum of the hand.

Electrodiagnosis and electromyography can assist in locating the level of the lesion and whether it is complete or partial. Trick voluntary motion of the finger flexors may produce moderately weak dorsiflexion. Relaxation of the fingers allows the wrist to drop.

Range of motion exercises must be done several times a day. The patient can be taught how to flex and extend each finger, the thumb, wrist and elbow. A functional splint should be kept on when not exercising the parts. This splint should keep the wrist in extension, the metacarpophalangeal joints in flexion and the phalanges in extension. Such a splint is described by Rusk.[12] The splint so-described can be modified when muscle power starts to return so that it can become a part of the exercise program using springs or rubber bands as the opposing force. Because the flexors of the hand and wrist are so strong compared to the extensors, it is important to keep the flexor tendons taut and the extensor tendons relatively short. This is accomplished by splinting in a functional position as described above.

Hydrotherapy in the form of whirlpool with the water temperature at 101° F is an excellent method of assisting adequate circulation. It also appears to relax the muscles both innervated and denervated. The use of electrical stimulation as a form of active exercise may slow down the process of atrophy. It is a helpful method of muscle re-education during the early stages of reinnervation. Once voluntary motion returns, the type and degree of exercise must be increased as tolerated.

At this stage, occupational therapy again becomes essential. As mentioned earlier, the distal delicate motions are the most difficult to attain and the earliest moment of retraining must be used. Incidentally, this is not as important with radial nerve injuries as it is when the ulnar or median nerves are involved, owing to the fact that our most highly developed finger motions are those of flexion. Occupational therapy of the one-handed type is encouraged so that the patient can carry on his activities of daily living independently using one hand. This is especially important when the dominant hand is the one injured.

Recovery, at best, is a long tedious process when one considers that it is about 500 mm. from the mid-humerus to the middle phalanx of the middle finger. At the fastest rate of regeneration (3 mm. per day), it will take about six months for reneurotization and perhaps two months more to recover use of the fingers.

The Deep Peroneal Nerve

Of all the branches of the sciatic nerve, the common peroneal is the most susceptible to injury. It may be injured by stretching, direct blow, pressure or by fracture of the head of the fibula. It is vulnerable because of its superficial course and the bone under it. It is neither protected nor cushioned. The superficial peroneal nerve supplies the muscles of the side of the leg, the peroneous longus and brevis. Sensory loss is confined to the more medial part of the dorsum of the foot. The deep peroneal nerve supplies the dorsiflexors of the foot and the extensors of the toes. Sensory loss is usually found on the dorsum of the foot and the outer aspect of the leg.

Because of the paralysis, there is a foot drop. If the superficial peroneal nerve is intact, there is unopposed eversion of the foot. If both peroneal nerves are involved, there is more inversion with the drop foot. The gait upon walking is quite evident. It is called by Haymaker and Woodhall[13] a "steppage gait"—the distal part of the foot and its outer margin drag, and at the end of the ex-

cursion, the foot tends to strike the ground with an audible "clap." If nerve involvement is not complete, the play or dance of the tendons varies from normal. Because of the atrophy of the muscles which dorsiflex the foot, the tibia stands out sharply like a keel. Tapping of the toes may produce a rebound dorsiflexion which may be misinterpreted as weak voluntary contraction of the toe extensors.

Electrodiagnosis and electromyography can assist materially in locating the level and severity of the lesion. Careful sensory examination will assist in outlining the sensory nerve involvement. It is not uncommon for regeneration to take ten months to a year.

The treatment is essentially the same as that for the radial nerve. Supportive bracing is most essential if the patient remains ambulatory. If the patient is over eighteen years of age, the power of the plantar flexors through the tendon achillis will lead to a shortened heel cord. If this condition exists for even a short period of time above this age, it cannot be stretched manually or by body weight. This is seen not infrequently when a skin-tight or unpadded cast is applied over the head of the fibula and the foot is incorporated in plantar flexion. Heel cord tenotomy may have to be instituted or a lift placed on the heel following recovery.

To prevent inversion or eversion and foot drop, a double bar short leg brace with a Klenzak ankle joint or a 90° (or less) stop built into a simple hinge ankle joint, can be used advantageously to allow the patient to ambulate.

Daily physical therapy of whirlpool or mild luminous heat and passive exercise to maintain range of motion must be instituted. Daily electrotherapy can be used. When reneurotization of the muscles becomes evident, active assistive and active exercise is taught and the amount increased as tolerated. As the muscles grow stronger, tension on the springs of the Klenzak joint can be reduced to put more work on the recovering muscles. Occupational therapy of the reverse treadle type can be instituted as soon as some voluntary muscle contractions return. In most instances, the patient can continue his occupation except if it involves being on his feet continuously or if it involves heavy labor affecting the lower extremities.

There is an interesting phenomenon about the return of function. The long toe extensors return first. This is followed by the tibialis anterior and finally the extensor hallucis longus.

Summary

1. A description of the etiology of peripheral nerve injuries is briefly described.

2. The method and physiology of the use of electrodiagnosis and electromyography in peripheral nerve injuries is explained. Reaction of degeneration and the diagnosis of partial denervation of a nerve are discussed.

3. The reasons for certain types of physical treatment are given and a general outline and rationale for them explained.

4. Three of the most common types of lesions are discussed with the variations in their management.

5. Finally, a word of pessimism: regardless of the type of injury, if there is degeneration, the chances for 100 per cent reneurotization and function of the muscle are exceedingly poor. However, with the body's natural margin of reserve, perhaps 80 per cent recovery or less may be more than adequate.

References

1. Henderson, W. R. and Taverner, D.: Some therapeutic and neurological aspects of peripheral nerve injuries. Lancet, 1:1084 (June) 1949.
2. Pollock, L. J., Goldseth, J. G., Mayfield, F., Arieff, A. J. and Oester, Y. T.: Electrodiagnosis of lesions of peripheral nerves in man. Arch. Neurol. & Psychiat., 60:1-19, 1949.
3. Napier, J. R.: The significance of Tinel's sign in peripheral nerve injuries. Brain, 72:63-82, 1949.
4. Sandifer, P. H.: Neuropsychiatry, Peripheral Nerve Injuries: Recent Advances in Physical Medicine. Edited by Bach, Francis. p. 222. Philadelphia: The Blakiston Company, 1950.
5. Watkins, A. L.: Physical Medicine in General Practice. p. 149. Philadelphia: J. B. Lippincott Company, 1946.
6. Rusk, H. A.: Rehabilitation Medicine. p. 405. St. Louis: C. V. Mosby Company, 1958.
7. Fischer, E.: Denervated muscle atrophy and electrical stimulation. Am. J. Physiol., 127:605 (Nov.) 1939.
8. Fischer, E.: A review of recent experimental work on peripheral nerve injuries. Virginia M. Month., 71:125 (March) 1944.
9. Wakim, K. G. and Krusen, F. H.: The influence of electrical stimulation on the work output and endurance of denervated muscle. Arch. Phys. Med., 36:370, 1955.
10. Grodins, F. S., Osborne, S. L., Johnson, F. R. and Ivy, A. C.: Stimulation of denervated skeletal muscle with alternating current. Am. J. Physiol., 142: 216, 1944.
11. Park, H. W. and Watkins, A. L.: Facial paralysis; analysis of 500 cases. Arch. Phys. Med., 30:749, 1949.
12. Rusk, H. A.: Rehabilitation Medicine. p. 188. St. Louis: C. V. Mosby Company, 1958.
13. Haymaker, W. and Woodhall, B.: Peripheral Nerve Injuries. 2nd Edition. p. 294. Philadelphia: W. B. Saunders Company, 1956.

Some Problems of Liver Diseases in Early Infancy

A long list of possibilities comes to mind when the physician is confronted with an infant who has jaundice and hepatomegaly. The author discusses five diseases that may produce such a picture. Diagnosis is important in some of these conditions to allow adequate treatment before irreversible hepatic damage ensues.

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DISEASE of the liver is not common in infancy, but it does occur with sufficient frequency that physicians must be aware of its various causes. Hepatomegaly is one of the chief manifestations. Table I lists the various causes of hepatomegaly noted in infancy. From this group of conditions, I have selected five for consideration, namely (1) atresia of the bile ducts, (2) the inspissated-bile syndrome, (3) infantile hepatitis, (4) galactosemia and (5) cytomegalic inclusion disease.

Infants having any of these diseases vary in age from a few hours to a few weeks. They are usually jaundiced, and they have varying degrees of hepatomegaly, splenomegaly or splenohepatomegaly. Some appear to be extremely ill, whereas others do not appear to be ill but are jaundiced. My colleagues and I have encountered infants having these five diseases among residents in southern Minnesota or in the immediately adjoining states.

TABLE I. CAUSES OF HEPATIC DISEASES IN INFANCY*

- Apparent enlargement and anomalies
  - Normal but palpable liver (right lobe only may be palpable)
  - Hepatoptosis
- Engorgement with blood
  - Heart failure
    - Congenital heart disease
    - Paroxysmal tachycardia
- Engorgement with bile
  - Obstruction of the bile ducts
    - Congenital obliteration
    - Inspissated-bile syndrome
- Inflammation
  - Infantile and neonatal hepatitis
  - Septicemia
  - Syphilis
  - Cytomegalic inclusion disease
  - Histoplasmosis
- Hyperplasia
  - Cirrhosis
- Infiltration and storage
  - Erythroblastosis
  - Lipide-storage diseases
    - Niemann-Pick disease
    - Gaucher's disease
      - Acute
      - Chronic
  - Gierke's disease (glycogenosis)
  - Galactosemia
  - Fanconi's syndrome (cystine storage)
  - Letterer-Siwe disease (reticuloendotheliosis)
  - Leukemia (rare)
  - Osteopetrosis (rare)
  - Toxoplasmosis (rare)
- New growths
  - Hemangio-endothelioma (rare)
  - Cancer (extremely rare)
    - Primary
      - Hepatoma
      - Mixed tumor
    - Secondary
      - Metastatic neuroblastoma

*Modified from Logan, G. B.: Significance of hepatomegaly in infants and children. Postgraduate Medicine, 13:469-472 (May) 1953.

Atresia of the Bile Ducts

This almost invariably means atresia of the extrahepatic biliary tree in part or in whole. Atresia of the intrahepatic biliary tree usually is associated with that of the extrahepatic system, but the extrahepatic system occasionally is intact. Atresia of the bile ducts may be included with diseases of the liver because the condition, if it is not recognized soon enough or if the lesion is inoperable, leads to cirrhosis of the liver and subsequently to death. The first sign is jaundice, which usually has associated with it the appearance of light or clay-colored stools and dark urine. A recent review[1] of the experience at the Mayo Clinic disclosed that many patients had the onset of jaundice at the time of birth or within the first day or so of life. Only 10 per cent of the patients in this clinic series were reported as doing poorly at the time of their initial examination at the clinic; the remaining 90 per cent did not appear ill.

Physical examination usually discloses only a jaundiced infant who has hepatomegaly or hepatosplenomegaly. The jaundice persists and, although

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it is characteristically said not to vary in intensity, occasionally it may appear to fluctuate clinically, and values for serum bilirubin determined serially may vary by a few milligrams per 100 ml. of serum.

The most important single diagnostic test in our experience is the determination of the amount of bilirubin in the blood. We have found values ranging from 4.2 to 37.5 mg. per 100 ml. of serum, the mean value being 12.8 mg. Others[2] have found similar levels. Nearly all of this is the direct-reacting type. In contrast, Weller[3] pointed out that the amount of bilirubin is of little help in making the diagnosis because the values are often low. However, in our experience, no other condition in patients of this age period will present consistently increased values for direct-reacting bilirubin in the blood.

Measurement of the prothrombin time (Quick) is helpful from a prognostic standpoint. Patients whose prothrombin time is prolonged live a shorter period than do those having normal values. Those whose prothrombin time is prolonged but who respond to the use of vitamin K live longer than do those who do not respond to the use of vitamin K.

Kove and associates[4] recently suggested that measurement of the enzymes glutamic-oxalacetic transaminase and glutamic-pyruvic transaminase may be of value in establishing the diagnosis of atresia of the bile ducts. At present, their report should be considered as only preliminary. Other tests of hepatic function offer little diagnostic help.

Reports in the literature show an incidence of operability in this condition varying from 18 to 25 per cent. In our experience, the incidence of operability has been 22 per cent. By being operable, we mean that the common bile duct may be atretic but that the hepatic duct, cystic duct and gallbladder are patent. All conditions in which the hepatic duct is atretic, regardless of other combinations of anatomic atresia, proved to be inoperable. Intrahepatic atresia also is not amenable to surgical correction. If children having extrahepatic biliary atresia can be operated on successfully before cirrhotic changes have occurred, the outlook for a normal life should be good.

Should the patient's condition not be amenable to surgical treatment, the prognosis for life will be variable; 75 per cent of such patients in the clinic series were dead within eighteen months. However, two lived as long as two and one-half years, one for four and one-half years and one for six years. Thus, one must use some judgment in discussing the prognosis with the parents.

The time to operate is when the diagnosis has been definitely established. It is usually best not to operate before the patient is four to six weeks of age but to make the decision before the child is three months of age. My colleagues and I do not agree with Harris and associates,[5] who prefer to delay the operation until the patient is four months of age. Cirrhosis is an invariable complication of atresia and has been seen in patients as young as two and one-half months. Cirrhosis developed in seven of our patients at five months of age or younger.

At the time of operation, the procedure of cholangiography plus biopsy of the liver is preferable to manual exploration of the biliary tree.[6] The latter is tedious, risky and difficult, and it may lead to an erroneous diagnosis of atresia when the ducts are tiny and difficult to identify.

Inspissated-Bile Syndrome

Considerable disagreement exists as to whether this condition really occurs. It was first mentioned by Ladd,[7] in 1935. The syndrome comprises obstructive jaundice resulting from mucous plugs or inspissated bile in the biliary system. A number of instances have been reported after or as a complication of severe erythroblastosis. However, a number of cases have been reported as instances in which the etiologic factor is unknown. Many of the patients in this latter group have been shown actually to have hepatitis. Harris and associates,[5] and also Gellis and co-workers,[8] thought that the term "inspissated-bile syndrome" is best not used, because it implies that the defect is of mechanical origin rather than a lesion of the hepatic cells. Such an entity does occur, however, and it may be treated medically and sometimes surgically.

The onset is in the early weeks of life. The important symptoms and signs are jaundice, dark urine, light stools and hepatosplenomegaly. The bilirubin may be mostly of the direct-reacting type, but often both direct-reacting and indirect-reacting types are present. Values are about the same as they are in those children having atresia of the bile ducts. The jaundice usually fluctuates. The definite diagnosis can be established only by finding inspissated bile or mucous plugs at the time of duodenal drainage or operation.

Treatment by means of duodenal drainage requires a skilled and patient intubationist. Dehy-

drocholic acid (decholin) may be administered intravenously at the time of the drainage. Duodenal drainage is best not carried out oftener than three times a week. An oral preparation of desiccated bile salts (ketochol) may be given with each feeding for one to three weeks.[9] If one can be sure that he is not dealing with hepatitis and if the jaundice persists, then surgical intervention is advisable.

Infantile and Neonatal Hepatitis

This condition is recognized more often now than it used to be. Most of the reports in the literature concerning its occurrence appeared in the period from 1951 to 1956.[8,10-13] The onset may be from the time of birth on. The etiologic agent most commonly encountered is the virus of serum hepatitis (SH, or virus B). In some instances, it has been proved that the mother is a silent carrier of this infection.[14] It is unlikely that the virus of infectious hepatitis (IH, or virus A) is concerned unless the mother has had infectious hepatitis within a week or so of the child's birth. Hsia and associates[15] made follow-up studies on a large group of women who had infectious hepatitis during pregnancy and found no evidence of hepatitis in their offspring. Other viruses subsequently may be implicated as etiologic agents.

Clinically, the infant appears jaundiced. He may be acutely ill or may have few general symptoms. Hepatosplenomegaly is present. The urine is dark, and the stools may be light. The blood bilirubin is moderately increased. The value for the direct-reacting fraction usually is 50 per cent or more of the total, the rest being of the indirect-reacting type. Values for transaminases are usually increased. It should be remembered that the fractions of the blood proteins as determined electrophoretically are somewhat different in infants than they are in older children and adults.[16] For this reason, the various flocculation tests for hepatic function such as the cephalin-cholesterol and thymol turbidity tests are of little value, the results being rather inconstant. Harris[16] pointed out that the values for the zinc sulfate turbidity test are normally low during the early months of life. Values that would be considered normal in the older child or adult actually represent abnormal increases in an infant a few weeks of age, constituting evidence of hepatocellular dysfunction.

It has been noted that infants who have hepatitis do not withstand surgical intervention very well.[16] If an infant having jaundice is operated on and a patent biliary tree is found but bile is absent, nothing should be done surgically to that biliary tree. Biopsy of the liver should be done to help establish the diagnosis of hepatitis. Kiesewetter and co-workers[17] have reported several instances in which a patient who had hepatitis was operated on and in whom bile was not found in an intact biliary tree. We have had at least one such experience.

Pathologically, multinucleated giant cells have been described in the liver in this type of hepatitis. Because of the description by Craig and Landing,[18] the term "giant cell hepatitis" has come into fairly common use, although these workers did not give the disease this name. Baggenstoss,[19] and Popper and Schaffner,[20] as well as others, considered that the giant cell reaction is simply an infantile reaction to an infection. The term "giant cell hepatitis" probably does not connote any special entity, and its use should be discontinued. The so-called giant cells are apparently multinucleated hepatic parenchymal cells.

The following case report represents an example of severe hepatitis.

Case 1.—A boy, aged thirty hours, from southern Minnesota was brought to the clinic because he was vomiting blood. He was the second child. The father was living and well. The mother had not had any known illnesses during her pregnancies. Subsequently, results of her liver function tests were normal. The delivery had been normal.

When admitted to our service, the infant was somewhat obese and jaundiced; petechiae were present. During a period of ten hours in the hospital, the value for hemoglobin decreased from 12.5 to 10 gm. per 100 ml. of blood. Platelets numbered 36,000 per cubic millimeter of blood, and the leukocyte count was 14,000 cells, of which 63 per cent were polymorphonuclear. The value for bilirubin was 13 mg. per 100 ml. of serum, and all of it was of the indirect-reacting type. A clinical diagnosis of septicemia was made.

Treatment was the use of antibiotics and blood transfusion. The child died ten hours after admission. Two blood cultures taken during life subsequently were reported as giving no growth of organisms. Pathologically, the liver presented the appearance of acute hepatic necrosis, the cause of which was undetermined.

The mortality rate of neonatal hepatitis is high and though some infants having hepatitis recover with only supportive treatment, cirrhosis may be a complication or sequel, as in the following case.

Case 2.—A twenty-month-old boy from northern Iowa was brought to the clinic because of lifelong jaundice and

TABLE II. METABOLIC PATHWAY OF GALACTOSE*

(1)	Galactose + adenosine triphosphate	$\xrightarrow{\text{galactokinase}}$	galactose-1-phosphate + adenosine diphosphate	
(2)	Galactose-1-phosphate	$\xleftrightarrow{\text{uridyl transferase and galactowaldenase}}$	glucose-1-phosphate	

*From Komrower, G. M., and associates.[21]

hepatosplenomegaly. He had been surgically explored in another hospital when he was seven weeks of age; biopsy of the liver at that time showed hepatitis, many giant cells being present.

When he was examined at the clinic, the liver and spleen extended 7 and 5 cm., respectively, below the costal margin. It was thought that special treatment would not be of value.

He was examined again when he was almost six years of age. His appetite had been poor. He had had frequent colds, his spleen had greatly enlarged, and prominent veins had developed in the abdominal wall. The jaundice had disappeared.

The edge of the liver was palpated 3 to 4 cm. below the costal margin, and the spleen extended to the iliac crest. Esophagoscopy failed to demonstrate any varices; however, he bled afterward from the esophagus.

A diagnosis of cirrhosis with portal hypertension was made. A splenorenal shunt was established surgically. Biopsy of the liver was interpreted by the pathologist as showing extremely severe cirrhosis.

A younger sister of this patient apparently had hepatitis at the age of three weeks; she is now well, and results of her liver function tests are normal.

Galactosemia

This is a congenital familial error of metabolism. The condition may be of variable severity. Most infants so affected display evidence of the disease in the early days of life. However, symptoms do not develop in some until later. The onset usually follows the first feeding of milk. After this, the infant at times has difficulty in feeding and fails to thrive; hepatomegaly develops and jaundice subsequently appears. Loose stools may be noted. Cataracts may develop later. Enlargement of the liver and jaundice usually are noted after several weeks.

The value for bilirubin is moderately increased; the direct-reacting type constitutes somewhat more than 30 per cent of the total, the rest being of the indirect-reacting variety. The diagnosis is made by finding a reducing substance in the urine that is galactose, not glucose. It is not detected by use of paper strips for sugar analysis (tes-tape), but it is revealed by Benedict's test. Amino-aciduria also occurs, and albuminuria is present almost constantly. The urine is not dark, and the stools are normally colored.

The treatment is to stop the use of milk and all milk products. Galactosemia is caused by a defect in the enzyme uridyl transferase. The metabolic pathway of galactose is briefly shown in Table II. It was formerly thought that the toxic agent was galactose, but Komrower and associates[21] have demonstrated that it is really an accumulation of galactose-1-phosphate or one of its metabolic products and not galactose itself.

Cytomegalic Inclusion Disease

This infectious process may occur in children of any age; however, it has been reported in a number of babies in the neonatal period. Those who become infected and who give clinical evidence of the infection in the newborn period are more commonly premature infants.[22] The infection is usually fulminant. The onset is often within the first twenty-four hours of life. The infants become jaundiced and lethargic, displaying petechiae and ecchymoses. The spleen or liver or both become enlarged, the splenic enlargement usually being out of proportion to that of the liver. The picture is that of septicemia or a generalized infection. In a series reported by Medearis,[22] in 1957, three fourths of the patients were jaundiced and had a hemorrhagic diathesis, and two thirds of the babies had an enlarged spleen or liver or both.

This infectious disease is caused by the salivary gland virus, an infectious agent that is rather widespread. Regardless of the cause of death, 10 per cent of all infants on whom necropsy is done have evidence of inclusion bodies in the parotid gland. This finding has been taken as evidence of infection by this virus, which is pathogenic for the human.

The value for bilirubin in this disease usually is moderately increased, but sometimes greatly heightened levels are seen. The direct-reacting type makes up from 25 to 75 per cent of the total

amount. Most of the infants with this infection have involvement of the kidneys. Wyatt and coworkers,[23] in 1950, first reported a test in which the urine is examined for the presence of cells containing inclusion bodies. This procedure is of great aid in the differential diagnosis in any infant who has the afore-mentioned clinical picture.

Treatment is of dubious value. The prognosis in general is extremely poor. Margileth[24] reported an instance of recovery from this condition, the infant being treated with cortisone, gamma globulin and antibiotics. However, the child subsequently was mentally retarded and apparently not robust. Birdsong and associates[25] reported another case in which recovery took place. The infant was treated with vitamin K, penicillin and prednisolone.

Histopathologic examination discloses inclusion bodies in the kidney, liver and lungs; they also are sometimes found in the pancreas, thyroid, brain and salivary glands.

Summary

Disease of the liver, although not common in early infancy, does occur and requires prompt and accurate diagnosis. Hepatomegaly is one of the chief manifestations. From among the various causes of hepatomegaly in infancy, this paper considers five conditions, namely, atresia of the bile ducts, the inspissated-bile syndrome, infantile and neonatal hepatitis, galactosemia and cytomegalic inclusion disease.

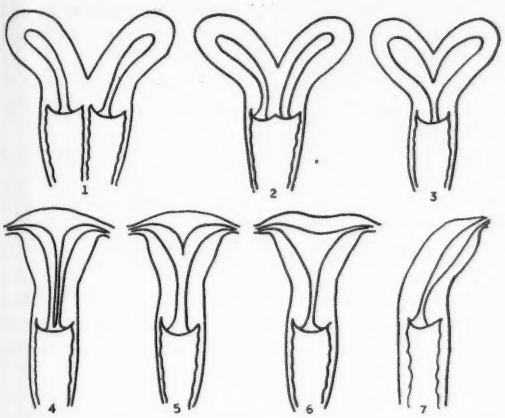
Children who have any of these diseases usually are jaundiced. The spleen also may be enlarged, in addition to the usual hepatomegaly. Some of the patients are extremely ill, whereas others appear rather well except for jaundice. Establishment of the correct diagnosis before irreversible hepatic damage has occurred is important as a guide to the proper surgical or medical treatment.

References

1. Myers, R. L., Baggenstoss, A. H., Logan, G. B., and Hallenbeck, G. A.: Congenital atresia of the extrahepatic biliary tract. Pediatrics, 18:767-781 (Nov.) 1956.
2. Christy, R. A., and Boley, J. O.: The relation of hepatic fibrosis to concentration of bilirubin in the serum in congenital atresia of the biliary tract. Pediatrics, 21:226-232 (Feb.) 1958.
3. Weller, S. D. V.: Observations on some liver function tests in infancy. Great Ormond St. J., 1:26-31 (June) 1951.
4. Kove, Simon, Goldstein, Stanley, and Wróblewski, Felix: Measurement of activity of transaminases in the serum as an aid in differential diagnosis of jaundice in the neonatal period. Pediatrics, 20:590-600 (Oct.) 1957.
5. Harris, R. C., Andersen, D. H., and Day, R. L.: Obstructive jaundice in infants with normal biliary tree. Pediatrics, 13:293-307 (Apr.) 1954.
6. Swenson, Orvar, and Fisher, J. H.: Utilization of cholangiogram during exploration for biliary atresia. New England J. Med., 247:247-248 (Aug. 14) 1952.
7. Ladd, W. E.: Congenital obstruction of the bile ducts. Ann. Surg., 102:742-751 (Oct.) 1935.
8. Gellis, S. S., Craig, J. M., and Hsia, D. Y. Y.: Prolonged obstructive jaundice in infancy. IV. Neonatal hepatitis. A.M.A. J. Dis. Child, 88:285-293 (Sept.) 1954.
9. Gross, R. E.: The Surgery of Infancy and Childhood: Its Principles and Techniques. Philadelphia: W. B. Saunders Company, 1953, pp. 508-523.
10. Collins, D. L.: Neonatal hepatitis including a case associated with maternal hepatitis during pregnancy. Canad. M. A. J., 75:828-832 (Nov. 15) 1956.
11. Schwartz, M. U., Gilman, R. A., Schwartz, Morton, and Settle, Janet: Neonatal hepatitis: Report of a case simulating obstructive jaundice. J.A.M.A., 155:557-559 (June 5) 1954.
12. Stokes, Joseph, Jr., Wolman, I. J., Blanchard, M. C., and Farquhar, J. D.: Viral hepatitis in the newborn: Clinical features, epidemiology, and pathology. A.M.A. J. Dis. Child, 82:213-216 (Aug.) 1951.
13. Krainin, Philip, and Lapan, Bernard: Neonatal hepatitis in siblings: Report of two cases with giant multinucleated liver cells and fatal termination. J.A.M.A., 160:937-940 (Mar. 17) 1956.
14. Stokes, Joseph, Jr., Berk, J. E., Malamut, L. L., Drake, M. E., Barondess, J. A., Bashe, W. J., Wolman, I. J., Farquhar, J. D., Bevan, B., Drummond, R. J., Maycock, W. d'A., Capps, R. B., and Bennett, A. M.: The carrier state in viral hepatitis. J.A.M.A., 154:1059-1065 (Mar. 27) 1954.
15. Hsia, D. Y. Y., Taylor, R. G., and Gellis, S. S.: A long-term follow-up study on infectious hepatitis during pregnancy. J. Pediat., 41:13-17 (July) 1952.
16. Harris, R. C.: Liver function tests in infancy. Bull. New York Acad. Med., 28:721-728 (Nov.) 1952.
17. Kiesewetter, W. B., Koop, C. E., and Farquhar, J. D.: Surgical jaundice in infancy. Pediatrics, 15:149-154 (Feb.) 1955.
18. Craig, J. M., and Landing, B. H.: Form of hepatitis in neonatal period simulating biliary atresia. A.M.A. Arch. Path., 54:321-333 (Oct.) 1952.
19. Baggenstoss, A. H.: Personal communication to the author.
20. Popper, Hans, and Schaffner, Fenton: Liver: Structure and Function. New York: McGraw-Hill, 1957, pp. 460-467.
21. Komrower, G. M., Schwarz, V., Holzel, A., and Golberg, L.: A clinical and biochemical study of galactosaemia: A possible explanation of the nature of the biochemical lesion. Arch. Dis. Childhood, 31:254-264 (Aug.) 1956.
22. Medearis, D. N.: Cytomegalic inclusion disease: An analysis of the clinical features based on the literature and six additional cases. Pediatrics, 19:467-480 (Mar.) 1957.
23. Wyatt, J. P., Saxton, J., Lee, R. S., and Pinkerton, H.: Generalized cytomegalic inclusion disease. J. Pediat., 36:271-294 (Mar.) 1950.
24. Margileth, A. M.: The diagnosis and treatment of generalized cytomegalic inclusion disease of the newborn. Pediatrics, 15:270-283 (Mar.) 1955.
25. Birdsong, McLemore, Smith, D. E., Mitchell, F. N., and Corey, J. H., Jr.: Generalized cytomegalic inclusion disease in newborn infants. J.A.M.A., 162: 1305-1308 (Dec. 1) 1956.

Septate Uterus with Abnormal Bleeding

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Figs. 1-7. (1). Uterus Didelphys, (2). Uterus Duplex Bicornic Bicallis, (3). Uterus Bicornis Unicallis, (4). Uterus Septus, (5). Uterus Subseptus, (6). Uterus Arcuatus or Cardiformis, (7). Uterus Unicornis.

It is always well to keep the diagnosis of a duplicated uterus in mind, especially in cases of vaginal discharge, bleeding and miscarriage.

CONGENITAL abnormalities of the female genital tract are not infrequent. Failure of fusion of the Müllerian ducts, gives rise to a variety of uterine anomalies. Failure in development may also occur in the vaginal tract as a persisting septum of the vagina. One of the simplest classifications is that of Jarcho.[1]

1. *Uterus Didelphys.*—A complete duplication of the vagina, cervix and uterus, probably the rarest of deformities. During a twenty-five-year period in the New York Lying-in Hospital as reported by Smith, only four cases of uterus didelphys were seen in 114,243 consecutive obstetrical patients, admitted (Fig. 1).

2. *Uterus Duplex Bicornis Bicallis.*—Here the duplication of the vagina is absent (Fig. 2).

3. *Uterus Bicornis Unicallis.*—Here there is one incomplete fusion of the fundus segment producing widely separate horns (Fig. 3).

4. *Uterus Septus.*—Here there is failure of fusion with a septum which extends the entire length of the uterus (Fig. 4).

5. *Uterus Subseptus.*—Here fusion is incomplete producing a septum in the upper one-half of the uterine cavity (Fig. 5).

6. *Uterus Arcuatus or Cardiformis.*—This apparently is the most frequent uterine deformity (Fig. 6).

7. *Uterus Unicornis.*—Here there is only one Fallopian tube (Fig. 7).

In the writer's experience three cases of abnormalities of the female genital tract have been seen.

1. On premarital examination a septum of the vagina extended throughout the vagina but was not attached to the cervix. The septum was removed with a resulting normal vagina.

2. A married woman came to the office complaining of leukorrhea. On examination, two individual and complete uteri were found with a

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normal single vagina. One cervix had an erosion, the other cervix was normal. The erosion was cauterized and the leukorrhea cleared up promptly.

3. The third is the patient whose case is reported here.



Fig. 8. Drawing of suspected abnormalities in the case of Miss R. S.

Report of Case

Miss R. S., a white woman, aged nineteen, was seen April 19, 1958. Her complaint was generalized weakness and vaginal bleeding for the previous two months. She used up to eight to ten napkins daily. Her past history was essentially negative. The menarche had occurred at age fifteen and had always been regular (twenty-eight days) lasting three to four days with moderate bleeding until these past two months.

General physical examination revealed a very pale, well nourished, well developed white woman weighing 120 pounds. Blood pressure was 140/80 mm. Hg., pulse 92, respirations 20, temperature 98.6°.

Laboratory data were as follows: hemoglobin 3.6 gm. (20 per cent); white blood count 6,250 per cm. mm.; red blood count 1,900,000 per cu. mm. Urinalysis was negative.

Pelvic examination revealed the presence of a double vagina, double cervices and the existence of a suspected double uterus. Each vagina admitted one finger with the right vagina slightly larger in diameter. They were separated by a septum about 0.5 cm. in diameter which extended from a point about 1½ cm. within the hymenal ring to the cervices. This septum resembled the lateral vaginal wall in appearance and in elasticity. The cervices were nulliparous and equal in size. There was bleeding from the right cervix but none from the left. The uterus was of normal size and seemed to be only one corpus.

The patient was hospitalized immediately because of severe anemia. Additional blood study revealed a hemoglobin of 3.4 gm.; red blood count of 2,030,000; Type O, RH positive. Eight pints of blood were given by transfusion over a period of eight days. Vaginal bleeding lessened after the patient received the first pint of blood and active bleeding stopped on third hospital day. The hemoglobin value on the third hospital day was 52 per cent, RBC 2,750,000; blood smear showed moderate hypochromasia, moderate polychromasia, moderate anisocytosis and poikilocytosis. On the eighth day, the hemoblogin was 11.5 gm. or 74 per cent, RBC 3,500,000, blood pressure 134/84, pulse 80. Patient was taken to surgery on the tenth hospital day.

Under sodium pentothol anesthesia, the vaginal septum was removed. The right cervix was dilated and curetted, with about 2 cm. of tissue being obtained. It was felt that there was a definite septum between the uterii. Postoperative recovery was uneventful.

The pathologic specimens examined by Dr. R. Hebbel of the Pathological Department of the University of Minnesota were reported as follows: (1) Microscopic section of a specimen from the vaginal septum shows fibrovascular connective tissue with a squamous epithelial covering on either side. (2) Microscopic section of the curettings from the right cervix shows a proliferative endometrium with some areas of benign hyperplasia. (3) Microscopic section of the curettings from the left cervix shows a proliferative endometrium.

The patient has had two normal menses since surgery. Hysterosalpingogram shows a double uterus with a single Fallopian tube from each uterus.

Discussion

Many abnormalities of the female generative tract may occur. Of particular interest in case No. 3 is the development of uterine bleeding in one uterine cavity of a septate or duplex uterus. The material obtained by curettage demonstrated that bleeding was due in this case to a benign hyperplasia. Reports of similar nature appear in the literature, such as reports showing endometrial carcinoma arising in one side of a duplicate uterus. The case presented here would seem to suggest that there must be some factor inherent in the endometrium itself to permit the hormonal changes usually considered as the cause for benign hyperplasia to occur in one side of this duplicated uterus and permit the other uterine cavity to maintain a normal endometrium.

Conclusion

Three cases of uterine abnormalities have been presented, including one case of abnormal uterine bleeding occurring in only on side of a duplicated or septate uterus.

The diagnosis and management of the abnormal bleeding has been discussed.

The suspected abnormalities of this case are shown by this drawing (Fig. 8).

References

1. Jarcho, J.: Malformation of the uterus. Review of the subject including embryology, comparative anatomy, diagnosis and report of cases. Am. J. Surg., 71:106-166 (Jan.) 1946.



Fig. 1. Lesion prior to resection.



Fig. 2. Resected specimen.



Fig. 3. Resected specimen showing area of bowel underlying infarction.

Acute Chylous Peritonitis

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IN 1954, Hoffman[1] reported the twenty-fourth case of acute chylous peritonitis requiring laparotomy. Along with a review of the previous literature, Madding et al[2] reported the twenty-fifth such case in March, 1958. In addition to being a rarely encountered phenomenon, the following case is unique in that a large chylous tumor was encountered which appeared to be causing infarction of the associated small intestine.

Case Report

L. C., aged thirty-eight, white, single carpenter, was admitted to the Naeve Hospital, Albert Lea, Minnesota, on February 7, 1957. He stated that the day prior to admission he had noted the onset of a crampy lower abdominal pain shortly after breakfast. He did not feel nauseated and did not vomit. By afternoon the pain was better but again it started after eating a light supper. This pain persisted through the night. On the day of admission he stated that he had had a normal bowel movement. No urinary complaints were registered. He was now quite nauseated but did not vomit. The pain was now steady and localized to the right lower abdomen.

Past history revealed a gastric ulcer in 1948 which had responded well to medical management. No epigastric distress was now noted except when eating fatty or spicy foods. He had had no operations and no previous hospitalizations.

Physical examination showed a lean, white man in only moderate distress. Blood pressure was 120/70 mm. Hg.; pulse, 76; temperature, 99° orally. The eyes, ears, nose and throat were normal. The neck showed no abnormality. The chest was clear to auscultation and percussion. The heart was of normal size and no murmurs were heard. The abdomen was relatively rigid but when not being palpated, loops of bowel could be seen through the abdominal wall. True muscle spasm was present on the right side and the maximum point of tenderness was over McBurney's point. Bowel sounds were absent. No masses were felt. The liver, kidneys and spleen were not palpable. Rectal examination revealed a normal size prostate and no masses. Tenderness was elicited bilaterally.

Laboratory studies showed a hemoglobin of 15.5 gm., hematocrit 49, white blood count 12,300 with 74 per cent polymorphonuclears, 25 lymphocytes and 1 eosinophil. Urine specific gravity was 1.018, negative albumin, sugar and microscopic. Chest x-ray showed normal heart and lung shadows. The scout film of the abdomen was not remarkable. No evidence of small bowel gas or bowel obstruction pattern was noted.

Diagnosis of acute condition of the abdomen was made, most likely on the basis of an acute appendictis. A premedication was given and the patient was prepared for the operating room.

Under general anesthesia, a McBurney incision was made and immediately upon entering the peritoneal cavity milky fluid was encountered. The presenting small bowel was found to have dilated lacteals with chyle oozing from the mesenteric surface. Palpation through the incision revealed a mass in the right upper quadrant so the wound was quickly converted to a Harrison-Kripps type of incision and the mass observed directly (Fig. 1).

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The mass was found to be a lipoma-like tumor 10 by 20 cm. in size within the mesentery of the proximal small bowel. It was filled with chyle which oozed freely from its surfaces. The size and pressure of the mass appeared to be obstructing both venous and arterial blood as evidenced by an early infarction of the bowel.

Within the involved mesentery, near the axis of the superior mesenteric artery, large nodes were palpated. It was believed that the primary cause of the mass and the lymphatic obstruction could be a lymphoma. Therefore to relieve the involved small bowel and enable a diagnosis to be made, a segmental resection of the intestine was performed (Fig. 2). The entire segment of involved mesentery (to its origin near the superior mesenteric artery) was removed with the intestine and mass. This, unfortunately, was not the only involved area of lacteal engorgement, but owing to the massive swelling of the entire radix, it was not thought advisable to attempt further exploration of the thoracic duct structures. The appendix was removed in the usual fashion and the wound closed anatomically without drainage.

Nasogastric suction was instituted while the patient was still in the operating room and he was returned to the recovery room in good condition.

The postoperative course was entirely uneventful. Gastric suction was discontinued in twenty-four hours and an afebrile course followed with an increasing low-fat diet. He was discharged on the ninth postoperative day after the sutures had been removed from a well healed wound.

The pathologist reported that the mass, when cut, contained large amounts of milky fluid causing the tissue to partially collapse (Fig. 3). This left a spongy appearance which could not be sharply demarcated from the surrounding mesentery. The mucosa of the intestine was thick and edematous, while on the serosal surface, the lymphatics were outlined as fine, white lines or whitish plaques. The mesenteric nodes were enlarged and when cut had a bright yellowish color.

Microscopically, the mesenteric tissues showed edema and a marked dilatation of the lymphatic vessels was seen to form small cysts. However, no true angiomatous character was noted. The intestine showed marked dilatation of serosal and mucosal lymphatics and some edema of the mucosa. Sections of the nodes showed small follicles separated by greatly distended sinusoids which were filled with phagocytic reticular cells and scattered foam cells.

Comment

The lymphatic drainage of the intestine goes *via* the lacteals to the cisterna chyli, the lower sacculated area of the thoracic duct. It lies in the area of the first and second lumbar vertebra. The thoracic duct courses upward along the thoracic spine to finally empty into the venous system at the junction of the left subclavian and internal jugular veins.

Blalock[3] and McGregor[4] report that ligation of the thoracic duct anywhere in its course will not cause a rupture of the distal lymphatic system. This is probably due to the diversion of the lymphatic drainage to the smaller, but effective, lymphatic system which drains the right chest and empties into the right subclavian system.

It is, therefore, postulated that the patient's obstruction sighted here must have been in the lacteal system prior to the cisterna chyli making diversion of lymph to the right lymphatic system impossible or at least delayed.

Causes of acute chylous ascites are listed as (1) obstruction due to malignancies or animal parasites (2) injury or division of the duct or (3) local inflammatory swelling about the proximal lacteals. However, of the twenty-five reported cases, 44 per cent have had no known etiology. One third were diagnosed preoperatively as acute appendicitis.

If one were able to diagnose the condition preoperatively, laparotomy could be avoided. Of the twenty-five cases now reported only one mortality was recorded. Drainage of the peritoneal cavity does not affect the outcome. The author has had one previous case where the patient presented himself with an acute cystic hygroma-type mass of the left supraclavicular area associated with acute abdominal pain. A preoperative chest x-ray revealed fluid in the left pleural space which was aspirated and found to be chyle. A laparotomy was not performed and recovery was uneventful with the use of antibiotics and application of diathermy to the supraclavicular area.

Summary

1. Acute chylous peritonitis is a rarely encountered disease which ordinarily has a good prognosis.

2. Diagnosis is rarely made preoperatively unless a chylothorax is associated.

3. Etiology is unknown in almost half of the cases.

4. A case of acute chylous peritonitis is presented. Associated with the peritonitis was a cystic hygroma whose pressure was appearing to cause infarction of the small intestine.

References

1. Hoffman, William: Free chyle in the acute abdomen. Surg. Gynec. & Obst., 98:209, 1954.
2. Madding, G. F.: Acute chylous peritonitis. Ann. Surg., 147:419, 1958.
3. Blalock, A. R.: Production of chylothorax by occlusion of the superior vena cava. Ann. Surg., 104:359, 1936.
4. McGregor, A.: Injuries of the large lymph ducts. Brit. J. Surg., 40:569, 1953.

Editorials

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THE NEW DEAN

At the University of Minnesota, the appointment of deans is a responsibility of the President and the Regents. In arriving at recommendations for such appointments, however, the President relies to a great degree upon the advice of the faculty of the school or college concerned.

To advise him in the selection of a new Dean for the College of Medical Sciences, President Morrill appointed an able and representative faculty committee, and then personally attended almost all of the meetings of the committee. The committee sought the advice of distinguished medical educators throughout the country and conferred with committees of the State Medical Association and of the alumni of the Medical School.

Adequate time was allowed for thorough and exhaustive consideration of all aspects of the situation, the result of which was a recommendation that Dr. Robert B. Howard be appointed to this position. President Morrill concurred in this recommendation and presented it to the Regents who in turn made the appointment.

"Bob" Howard needs no introduction to the physicians of Minnesota. He is one of us. His father was a physician who, for many years, carried on a general practice in Saint Paul. "Bob" attended the public schools of Saint Paul and the University of Minnesota, graduating from both the Arts College and the Medical School with honors. This was followed by graduate work, leading to a Doctor of Philosophy degree in internal medicine. After two years of military service with the United States Air Force, Dr. Howard returned to the Medical School as an instructor in medicine. This was followed in 1951 by his appointment as Director of the Department of Continuation Medical Education, a position vacated by Dr. George Aagaard when he resigned to accept the deanship of Southwestern University Medical School in Dallas, Texas.

As Director of the Department of Continuation Medical Education, Dr. Howard worked closely with the State Medical Association, many county societies, the Academy of General Practice and various specialty groups. His imaginative and enthusiastic leadership and his friendly effective cooperation with medical groups gave him a widespread and favorable acquaintance among the physicians of Minnesota and the Northwest.

During Dr. Howard's years as Director of the Department of Continuation Medical Education, I came to have a high regard for his keen and active mind, his earnestness, idealism and resourcefulness, his dedication to the job and his warm friendly personality.

Recognizing these qualities, I was immensely pleased that he was selected to carry forward the work to which I dedicated a major portion of my life, work in which he will have the invaluable assistance, as I have had, of a charming, devoted and efficient wife. He also will have the loyal support of an able medical faculty, of the alumni of the medical school and of the physicians of the State.

With these assets and this support, I am certain that under the new Dean, the future achievements of our Medical School in the fields of education, of research and of service will continue to be distinguished and to reflect credit upon the University, upon its alumni, and upon the State of Minnesota.

This being true, I congratulate the University upon the selection of Dr. Howard, and I congratulate Dr. Howard upon the tremendous opportunity for constructive leadership which has been presented to him.

HAROLD S. DIEHL, M.D.

RISK OF TRANSFUSION OBVIATED FOR MANY PREGNANT WOMEN

The problem of anemia associated with the pregnant woman is a formidable one. Earlier, this anemia was called a "physiological anemia" or a "dilutional anemia" and was ignored by many. The maternal mortality percentage was in part due to severe anemias. As our knowledge progressed, it became evident that the pregnancy anemias were for the most part iron deficiency anemias.

The history of iron in medicine dates back to the Roman soldiers who came from the battle field weak from blood loss and gained strength from drinking wine to which had been added rusty

nails. It is an amazing fact that this metal was introduced as a therapeutic agent as a result of the association of ideas in the minds of men that iron meant strength and protection, and hence, it would undoubtedly be of value in treatment of persons who suffered weakness from any cause.

Iron preparations are available today in a wide variety of forms and almost every drug manufacturer lays claim to a superior product. The fact that is not stressed is that the body has a limited faculty for the absorption of iron and it must be supplied over a relatively long period of time to meet the demand. Human nature is not imbued with the powers to remember to take a pill four times a day for many months.

When anemia is found during pregnancy, the time available for treatment is limited; and if not discovered until late in pregnancy then many physicians arm themselves with the wares of the blood bank and proceed. As evidence, the number of transfusions in 1959 is expected to reach six million units. Whole blood is a precious commodity and an invaluable therapeutic agent. In the field of obstetrics, catastrophic complications arise where the immediate administration of blood, frequently in large amounts, is imperative. It is not this necessary administration with which we are concerned, but it is the elective transfusions given the gravida in the prenatal period.

The use of blood in obstetrics was the subject of a recent report from the Parkland Memorial Hospital in Dallas. A review of the use of blood in gravid patients showed that for every 100 deliveries there were 50 pints of blood used. Transfusion therapy of this magnitude was costly, hazardous to the patients and did no more than temporarily correct the underlying defect which caused the anemia. During the past year, only seven pints of blood have been used for every 100 deliveries. This is a reduction of 85 per cent, or 2,046 pints of blood saved.

The reason behind the dramatic reduction in the administration of blood to obstetrical patients is parenteral iron. Iron in the form of iron dextran complex was introduced by the English and in excess of 7,000,000 injections have been used in that country and probably an equal number in this country. Iron deficiency is the defect in the great majority of anemias of pregancy. The fetus and blood loss at delivery withdraws 500 mgm of maternal iron which amounts to half of the normal woman's reserves. However, it is estimated that 40 per cent of the adult female population is anemic to some degree. Chronic blood loss, diet fads, gastric anacidity, hypothyroidism, chronic infection and pregnancy are important causes of the anemias.

A report from Hermann Hospital, Houston, Texas, in a series of obstetrical patients treated with intramuscular iron (Imferon) showed an average hemoglobin of 9.0 gms. initially and after six weeks therapy the average hemoglobin was 12.0 gms.

The safety of the product has been verified. Occasionally, transient local soreness and staining of the skin are noted.

For some years, it has been accepted practice to admit all severely anemic gravidas to the hospital for one or more transfusions. The judicious use of iron dextran in some areas has all but eliminated these admissions. It is advocated that oral iron be used in the mild iron deficiency anemias and parenteral iron in the more severe forms where iron stores are depleted. With the use of this therapy "transfusion reaction" will become a less common addendum to the final coding diagnosis on hospital charts of obstetrical patients.

H. L. McCLANAHAN, M.D.

HOW DOES YOUR RECEPTION ROOM LOOK TO YOUR PATIENTS?

Most physicians very naturally may not see the place where their patients wait because they come in the side door and depend on someone else to look after the reception room. It is the intent of this article to call attention to this often neglected phase of medical practice.

There is a trend today toward more spacious reception rooms, attractively decorated and comfortably furnished. Many doctors who have been hampered for years by inadequate quarters are moving into larger offices. Some have even built very attractive offices in outlying areas where parking space is not at a premium.

Without being argumentative, let us leave the question of location in a downtown Medical Arts Building, as compared to a suburban location, with the remark that there are advantages in both. The type of practice and locale of patients would be determining factors.

The problem of doctors moving into new quarters is relatively simple. They can start from scratch and do an excellent job of eliminating

deficiencies of their previous offices. Those who are forced to stay where they are have a more serious problem. Consequently, we shall discuss the two problems separately.

The doctor moving into a new location can solve his problems quite easily. He can start by planning a reception room of 16 to 24 square feet per seating unit, depending upon the type of practice and the length of time patients must wait.

As an example, a single doctor might provide seating for twelve in a room 12 by 16 feet. A clinic might provide for twenty to twenty-five in a room 22 feet square. An L-Shaped single room of similar space also lends itself to good arrangement. Single units of seating are preferable to two and three-seater settees.

Arrangement of the room in seating groups of two, three or four is desirable, as compared to the straight-line technique. A patient may gain a certain degree of privacy through such an arrangement. If you must have straight lines of chairs on each side of the room, break them up with magazine tables, planters or a partition.

There is a tendency to crowd chairs together too closely. A distance of 8 to 10 inches between chairs will allow your patients to sit down, move about and rise without bumping those on either side. Think of those who are shy or nervous, or worse yet, have some skin affliction, or are crippled in any way. A measure of privacy is priceless.

Chairs in a reception room should be comfortable. A combination of deep lounge chairs and higher straighter chairs is desirable. Some people have difficulty arising from lounge chairs and prefer the higher chair. Upholstery should be leather or imitation leather, particularly if the room is air-conditioned. This type of upholstery is easier to keep clean and will appeal to your patients as being more sanitary.

Ample space should be provided for outer wraps. Many waiting rooms are cluttered with wraps on chairs. Provide your patients with an office valet on which to hang their outer coats. Valets are relatively inexpensive and are available in sizes for either six or twelve coats. Your room will be improved if you can partition the coat room or hide it by an attractive planter.

Many doctors are forced through lack of available space, a long lease, or other reasons, to remain in offices where they cannot do the kind of renovations they would like. However, there are many things that a doctor can do to improve his present quarters.

Quite often one office will be larger than necessary, and others will be cramped. Moving of partitions is not expensive, and even small changes sometimes work wonders.

In such cases, a doctor can very often obtain very practical advice on an economical basis. Your office supply and office furniture dealer can be helpful in making suggestions, and his only fee would be the profit on whatever merchandise you might purchase.

The entire approach to arrangement of reception rooms should be on the basis of making the patient feel at ease. Patients are inclined to be tense whenever there is a question about their health. A waiting room that is pleasing, comfortable and relaxing should pay off handsomely in time-saving and retaining patients.

R. G. Scott

THE THIRD PARTY—FRIEND OR FOE?

The delicate nature of my subject is self-evident. In many areas of the country, controversy between the medical profession and a third party has been bitter and a solution is still not in sight.

It is my purpose in these observations to relate to you some historical facts about the socioeconomic aspects of the third party in medicine with which I am familiar and their significance to the medical profession here and elsewhere.

THIRD PARTY DEFINED

First of all, I should like to explore definitions of the third party. One of the outstanding physicians in Pennsylvania, a Past President of the American Medical Association, gave me this definition, which I for one am willing to accept: "Economically, the third party is anyone or any organization that arranges in any way to pay for professional services rendered a patient by his physician."

In gathering material for this presentation, I wrote thirty-one Washington physicians for their definitions and other pertinent information. Several of them called me on the telephone and wanted to know what the third party was. One asked me if it was a new political party. Some went along with the definition already quoted. Others

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offered some which were quite unique, such as the physician who would include any one of the following as a third party: nurses; laboratory, x-ray, or physical therapy technicians; parents of a minor; adult children of an aged and infirm patient, whether appointed guardians or not; courts (in psychiatric cases); hospitals; insurance carriers; public health officials, and many others.

In a recent newspaper release, the Blue Shield Commission insisted that its organization was not a third party because it is "of the profession itself." Personally, I do not agree. The fact is that Blue Shield Plans act as intermediaries, collecting dues from subscribers and paying physicians, usually in accordance with a fee schedule.

Lest I be misunderstood, this is not intended as a criticism of Blue Shield. After all, as secretary of one of its Plans I am well aware of the unique relationship which exists between this organization and the medical profession.

So much for definitions. Being primarily concerned with the economic aspects of my subject, I will accept the first-mentioned definition, that a third party is any individual or organization that assumes the responsibility for paying a physician for his services to a patient.

I need hardly remind some of the older physicians that third party medicine has been on the medical scene a long time. It has been the heart of many controversies, within and without the medical profession, for the past three decades or more. For better or for worse, it has flourished and become a major factor to be reckoned with by the medical profession.

Why has this growth occurred? There is no simple answer to that question, but a look into the past will give us some clues.

MEDICAL CONTROVERSY IN THE MAKING

Just a month before the disastrous stock market crash in 1929, I was employed as an executive secretary of a large county medical society in Milwaukee, Wisconsin, which is an industrial city. Although I had had eight years' experience as business manager of a medical clinic, the larger economic problems of medicine were new to me. I soon made some important discoveries.

First, there appeared to be a "revolution" in the making where methods of providing and paying for medical care were concerned. The now historic five-year study of the Committee on the Costs of Medical Care, headed by Dr. Ray Lyman Wilbur, Past President of the AMA, and underwritten financially by eight Foundations, had been in progress since early 1928. Several individual studies which would be incorporated in the overall study were being released for publication from time to time.

It soon became evident from the tenor of these reports that the Committee would not be unanimous in its findings. Of the fifty members of the Committee, seventeen were physicians engaged in private practice. The others represented public health, social sciences, the public, and institutional and special interests.

In the Committee's final report, released in 1932, the majority recommended among other things that "both preventive and therapeutic (services) should be furnished largely by organized groups of physicians, dentists, nurses, pharmacists, and other associated personnel, such groups to be organized preferably around the hospital, for rendering complete home, office, and hospital care," and that "the costs of medical care be placed on a group payment basis through the use of insurance, through the use of taxation, or through the use of both these methods."

The principal minority group, representing the viewpoint of private physicians, on the other hand, recommended that Government competition in the practice of medicine be discontinued, that its activities be restricted to the care of the indigent, promotion of public health, support of medical departments of the armed forces, and the provision of medical care to veterans suffering from bona fide service-connected disabilities and disease. There was pointedly no endorsement of voluntary health insurance, although the development of plans for medical care by medical societies was recommended. There were no suggestions offered as to the kind of plans these should be.

Recommendations of both the majority and the minority groups stirred up heated discussions throughout the country and marked the beginning of a controversy which has continued down to the present time.

If any of you have not read the final report of the Committee on the Costs of Medical Care, you should do so, as nearly all the economic issues facing medicine today stem from this document.

There were, at that time, other problems of more immediate concern to physicians in Milwaukee. Agitation had nearly reached a boiling point over contract practice. A large number of physi-

cians in this industrial community had an agreement with some industry, mutual aid society, or fraternal organization. Some of the more agitated physicians who had no contracts insisted that the "rascals" who had them be thrown out of the Medical Society. The situation, which was not peculiar to Milwaukee, finally reached a stage where it seemed that the organization would be split down the middle. Fortunately, the strategy developed by officers of the Medical Society in an effort to heal differences worked.

However, contract practice continued to be an irritation to many physicians, who were very vocal about it. In one instance, lodge practice reached such a low ebb as to quality that even the men who had accepted these arrangements quit in disgust.

Physicians engaged in so-called ancillary services were especially pessimistic about the situation. The President of the Milwaukee County Medical Society, for example, wrote an article entitled, "Can the Pathologists Survive?" He raised the question which one still hears today: "What is there to prevent the pathologist's present position being recognized as a precedent for hospitals' employing surgeons and internists in the same manner in which pathologists and roentgenologists are now employed?"

For some years thereafter, there were scattered flurries of excitement among the profession over these issues, but finally things settled down to a simmer. The Depression had deepened, and the New Deal was in the ascendancy. Unemployment increased rapidly, with the result that at one time in Milwaukee a substantial part of the population was on relief. Many physicians and their patients, therefore, were in financial straits.

On the initiative of the Medical Society county, authorities agreed to pay physicians caring for the medically indigent on a fee basis. It became a far greater undertaking than was anticipated in the beginning and, of course, lasted much longer.

Early in 1933, it became quite apparent to leaders in organized medicine that several signers of the majority report of the Committee on the Costs of Medical Care and their supporters were preparing to implement their recommendations if at all possible. Articles dealing with medical costs were appearing in newspapers and magazines with increasing frequency.

The New Deal Administration announced it would seek the enactment of compulsory health insurance legislation. This was on its list as a must. Organized medicine was equally determined that such legislation should not be enacted. Surprisingly, the Administration did not press the matter too strongly until 1943, when the first Wagner Compulsory Health Insurance Bill was introduced.

Deeply concerned with these developments were a handful of medical leaders who urged not only the endorsement of voluntary health insurance but that something be done to get prepayment plans into operation.

It must be admitted that there was not much enthusiasm for this proposal among the medical profession. One of the most influential medical leaders of that period was the late Dr. Olin West, then Secretary and General Manager of the American Medical Association. Those of us who knew Dr. West held him in highest esteem. He was a man of convictions, integrity, and great courage. It was he who made the statement in the latter 1920's that "one great outstanding problem for the medical profession today is that involved in the delivery of adequate scientific medical service to all the people, rich and poor, at a cost which can be reasonably met by them in their respective stations in life." But Dr. West was no friend of medical society-sponsored voluntary health insurance plans. He was, to put it mildly, opposed to health insurance programs of any kind. I recall discussing the matter with him one time in Chicago. He was vehement in his insistence that voluntary health insurance could only lead to the compulsory variety.

Whether he was correct in his opinion, only time will tell. At any rate, a number of highly regarded physicians at that time disagreed with him, taking the position that a negative stand could not be justified. Leading physicians in such states as Wisconsin, Michigan and California raised their voices in strong support of prepaid medicine on a voluntary basis.

Before the 1930's came to a close, medical society-sponsored prepayment plans had made or were about to make their bow in California and Michigan. Washington State and Oregon had for a number of years a form of prepayment which was quite different from that which came later. Prepayment medicine did not gain real momentum until the 1940's, when Blue Shield came into existence.

These, then, are some of the phases of third

party medicine which occupied the attention of the medical profession until World War II, when discussion of the subject ceased for the duration of the War.

With the passing of the Truman Administration and the election of President Eisenhower, the fire of controversy again died down perceptibly.

GROWTH OF THE THIRD PARTY

What is the situation today? Has the third party withered on the vine, or has it flourished? The answer is obvious to everyone. As I stated in the beginning, it is only too apparent that the third party has gained great momentum, with what effect remains to be seen.

Contract practice, especially as it involves hospitals, is still an issue. Legal proceedings have been instituted in some states to prevent the corporate practice of medicine. In one or two instances these efforts have been successful, the most outstanding being in Iowa.

There is no need to dwell upon the phenomenal growth of voluntary health insurance. Although still in its infancy it is a lusty infant. Dr. Odin W. Anderson, Research Director of the Health Information Foundation, states that in 1957, 40 per cent of the total expenditures for health services was paid for by a third party. One hundred and eighteen million persons now have some form of health insurance. However, most of the present insurance and prepayment plans offer limited protection against the costs of illness.

"The drive for expansion of benefits," Dr. Anderson states, "has proved to be relentless since the costs outside the hospital frequently prove to be unduly burdensome for a family."

Six to 700 insurance companies are writing health insurance. There are about 300 Blue Cross, Blue Shield, and other nonprofit plans in operation. Most of the plans providing medical services permit free choice of physicians among those who agree to participate.

In the minds of a large number of physicians Blue Shield Plans are the big hope for the future where the medical profession is concerned. If proper leadership is given them, and if the medical profession co-operates they are confident of success in meeting the reasonable demands and the needs of the people as regards the payment of their medical bills.

As is well known, not all physicians approve Blue Shield Plans. Some say physicians should not engage in the insurance business and should get out of it as soon as they can. Others resent what they consider dictation of their fees. Still others disapprove disciplinary measures by a committee of their colleagues against participating physicians. By and large, the protestations of these physicians are looked upon by those who favor Blue Shield as growing pains.

Commercial insurance companies came into the voluntary health insurance picture following the lead of medical societies. When it became apparent to the companies that prepayment was not only feasible but could be made sound actuarially they became actively interested.

It is superfluous for me to tell you that labor unions are and will undoubtedly continue to be a formidable factor in third party medicine. They control vast health and welfare funds. This places them in a strategic position. It is apparent that much patience and good will on the part of both labor and the medical profession will be required to arrive at a mutually satisfactory understanding.

Nothing has been said up to this point about local, state, and Federal governments as a third party. Agencies included in this category are public health departments, all of which engage to a considerable extent in both curative and preventive medicine; the Veterans Administration, which not only provides all forms of medical care for veterans through its hospitals but in some states home care rendered by private physicians; and a large number of general and specialty hospitals and other medical institutions which make available medical service to a large segment of the country's population. The Government's Medicare program is the most recent arrival upon the third party scene. As you know, this program provides medical care for dependents of personnel in the uniformed forces under agreements with most state medical societies.

This, of course, is only a partial list of organizations and institutions which can be classified as a third party. It is sufficient, however, for the purpose of this discussion.

WHAT ABOUT THE FUTURE?

Understandably, these developments have deeply concerned many physicians who have grave misgivings about the future of private medical practice. The question uppermost in their minds is: What is the best course for the medical profession to pursue? Is the third party situation the menace

it appears to be? What elements in the third party arrangement are essential to safeguard the best interests of patients and physicians? What should be done to win sympathetic public support for the medical profession's point of view? I have discussed these questions with a number of physicians engaged in private practice for whose judgment I have the highest regard. The following, with slight variations, is a consensus of their views.

They were unanimous on one point—inroads of third party medicine will continue and will expand. As one physician wrote me, "I believe you will agree that there is nothing on the horizon lessening third party activities. I only hope that we will recognize that we have both friends and foes and will consider each case on its merits. To fight the inevitable on general principle is to fight a losing battle."

Of course, this physician said he did not mean that the profession had to accept anything that was handed it. He did mean that there would have to be some pretty objective thinking in the top echelons of organized medicine about the third party issue. First things, he insisted, will have to come first, and where medicine is concerned that is, as it always must be, the welfare of the patient.

Whether the third party is friend or foe in the minds of most physicians depends upon three things: (1) acceptance of the free choice principle, (2) noninterference in professional matters, and (3) adequate compensation, preferably on a fee basis.

The best assurance of maintaining free choice, my medical associates insisted, is for the profession to see to it that the quality of medical service is kept at a uniformly high level. Most physicians with whom I talked believe that much more should be done to assure the people that they need have no concern on this score.

At the present time a licensed physician can do as he likes about keeping abreast of medical progress. He may be, and sometimes is, content with what he learned in medical school and through experience in practice. Hospital medical staffs, however, have done much to maintain high standards of practice, but there is very little supervision of them outside these institutions.

Any mandatory requirement that all licensed physicians meet arbitrary standards of practice would undoubtedly meet with strong opposition by the profession. Nevertheless, this factor in the acceptance of the free choice principle cannot be ignored. The American Academy of General Practice recognized this when it required of its members that each year they do a certain amount of postgraduate study.

Another barrier to acceptance of the free choice principle, according to physicians with whom I have discussed the subject, is failure of medical organizations to take effective disciplinary action against wayward members. Grievance committees, in most instances, they say, are soft cautious, or ineffectual. However, they admit there are a number of exceptions. The State of Washington now has a Medical Disciplinary Law which is being watched with considerable interest by the medical leaders.

The most prized prerogative of a physician is his freedom to exercise his professional judgment without interference. This is something that medicine has fought for with unyielding vigor. It is vitally important to patients as well as to physicians.

There is no question in the minds of students of the subject that in a decade or less voluntary insurance plans, if they are still in existence, will have enjoyed tremendous growth and provide much greater coverage than they now do. In fact, it is certain that most of the people in this country, probably 90 per cent of the population, will be protected by health insurance in some form. This means, of course, that the third party will be largely responsible for their medical bills. Fee schedules or specified payments for various procedures will of necessity have been accepted by the medical profession.

If this situation should come to pass, how satisfactory will the medical profession find it? That depends on how alert they have been and the leadership they have shown. One would think, with all the discussion, all the articles, and all the books that have been written on the socioeconomic aspects of medicine, that much of it would have permeated the doctor's thinking. On the contrary, it is surprising how few are informed, or are very interested in this subject. Happily, there is a group of whom this is not true. They are the ones on which many of us are pinning our hopes.

It is well known that socioeconomic patterns adopted nationally are never abandoned. One can be certain, for example, that Social Security is here to stay. So is contract practice. So is volun-

tary health insurance. In this situation it is vital that organized medicine provide constructive leadership.

Whether the third party is a friend or foe then depends a great deal upon medical leadership. This is especially true where the voluntary health insurance plans are concerned. The medical profession needs to know more about these plans and those who administer them. Without question, they are organized medicine's most valuable instrument in dealing with medical costs.

A few weeks ago Dr. Edward J. Stieglitz, a nationally known authority on the aging and a member of our Medical Society, submitted an article for publication in our medical journal entitled, "Water." In this article he stated he could not recall water being ever mentioned in scientific journals as a nutritional element.

"This blind spot," he wrote, "has often reminded me of the anecdote about the barfly who said to the bartender that blindfolded he could identify all ingredients in any mixed drink which the bartender could concoct. If he failed, he would pay double for the drink, but if he succeeded, he would get it free. The bartender mixed one cocktail after another. The contents of each was identified with unfailing accuracy. In desperation, the bartender presented the man with an educated palate with a glass of water. The man tasted it carefully, rolled it about in his mouth, tried another sip, but was obviously puzzled. Finally he said, 'I don't know what this is, but I am sure it won't sell.' "

If the facts presented and the views here expressed are unacceptable to you, I have made no "sale." On the other hand, if what I have said has opened up some new channels of thought on controversial issues, it will not have been time wasted for any of us.

THEODORE WIPRUD

Mr. Wiprud is Executive Director and Secretary of the Medical Society of the District of Columbia.

A RESOLUTION CONCERNING THE PRACTICE OF PATHOLOGY IN MINNESOTA

1. WHEREAS, the honored ideals of the medical profession are designed to render the best possible service to the patient and to society through planned direction and the practice of most modern medical care, in the continuous struggle against deterioration, suffering and the disease of mankind, and

2. WHEREAS, the natural history of the development of laboratory medicine over a half century has been from the very few and simple procedures needing but little medical guidance to the numerous and complex modern highly efficacious procedures requiring a special medical training for their proper execution, and

3. WHEREAS, the early limited usages and slow advances in pathology in the hospital laboratories resulted in an early acceptance of the responsibility of laboratory medicine by lay administrators and Boards of Directors of hospitals, and

4. WHEREAS, the wisdom of the original State laws and subsequent rulings of the State Supreme Court concerning the practice of even the simplest laboratory procedure under the direct and complete control of trained physicians of Medicine has now reached a pinnacle of acknowledgment by those most likely to know, i.e., the licensed physicians of the State, and

5. WHEREAS, the physicians of the country have repeatedly studied these problems and have stated in 1943 that, "The House of Delegates of the American Medical Association is opposed to the division of any branch of medical practice into so-called technical and professional factions," and later, in 1951, that, "The practice of anesthesiology, pathology, physical medicine, and radiology are an integral part of the practice of medicine in the same category as the practice of surgery, internal medicine or any other designated field of medicine, and in 1955 re-affirmed its position on these matters and in 1958 the House of Delegates of the Minnesota State Medical Society stated in part that it "officially recognizes the specialty of Anatomical and Clinical Pathology as the practice of medicine; reaffirms the philosophy that in-hospital and out-patient diagnostic laboratory services are in fact the practice of medicine, and in future contracts or actions relating to laboratory medicine actively reaffirms the belief in the legal control of all medical laboratory facilities in the State of Minnesota by licensed doctors of medicine," and

6. WHEREAS, the present-day control of the medical specialty of Clinical and Anatomical Pathology in most of the hospitals in Minnesota by lay corporations, eleemosynary or otherwise, has placed an ever-increasing restraint and interference upon the scientific advancements in Pathology to the great detriment of the patients and the public; therefore

BE IT RESOLVED, that the Minnesota Society of Clinical Pathologists requests the concerted effort of the Minnesota State Medical Association to (1) bring all laboratory medicine under Minnesota Medical Service Contracts, and (2) as soon as possible eliminate the controlling role of the non-medical, third party in the practice of Pathology in all of the non-governmental hospitals of Minnesota.

Approved by: MINNESOTA SOCIETY OF CLINICAL PATHOLOGISTS

President's Letter

SEE YOU IN DULUTH!

Spring is here and soon we shall be hearing, on radio and television, the old familiar strain, "Take Me Out to the Ball Game." It will also mean that the 106th Annual Meeting of the Minnesota State Medical Association is not far away. The meeting this year will be held at Duluth, Minnesota, the "air-conditioned city" at the head of the St. Lawrence Seaway, on May 25, 26, and 27, 1959.

Your committee on Scientific Assembly has been working diligently, and the program is ready to go to press. The Monday morning (May 25) session will lead off with "What's New in Cardiovascular Disease." This panel, sponsored by the Minnesota Heart Association, will be moderated by Dr. F. J. Hirschboeck of Duluth. The panel will consist of Henry I. Russek, M.D., New York City; James W. Culbertson, M.D., formerly with University Hospitals, Iowa City, now in Memphis, Tennessee, and John W. Kirklin, M.D., Rochester, Minnesota. This, I am sure will be high class.

The cardiac panel will be followed by the Russell D. Carman Lecture—delivered by James E. Lofstrom, M.D., Professor of Radiology, Wayne University, Detroit, Michigan. Soon to follow will be a discussion by Paul Medelman, M.D., and John Briggs, M.D., on "Routine Hospital Admission X-Rays and other Tuberculosis Control Measures."

On Monday afternoon, there will be a Symposium on Breast Cancer, moderated by F. W. Lynch, M.D., Professor of Dermatology, University of Minnesota. C. D. Haagensen, M.D., New York City, sponsored by the American Cancer Society, will be the guest speaker on "Surgery." B. J. Kennedy, M.D. and Donn Mosser, M.D., from the University of Minnesota, will speak on "Chemotherapy" and "Radiation Therapy," respectively. At 4:00 p.m., Monday, Ian Brown, M.D., Neurologist, St. Paul, Minnesota, will conduct an interesting panel on "Management of Strokes." Dr. Brown will be assisted by Glenn Gullickson, M.D., Psychiatrist, University of Minnesota, Davitt A. Felder, M.D., St. Paul, Vascular Surgeon, and Dr. Shirley Holt Mink, Minneapolis, a certified Psychologist.

Tuesday, May 26, R. S. Ylvisaker, M.D., Minneapolis, will moderate a Symposium on Massive Gastro-Intestinal Bleeding. Assisting Dr. Ylvisaker will be E. E. Wollaeger, M.D., Rochester; R. B. Tregilgas, M.D., St. Paul; Lyle Hay, M.D., Minneapolis, and Owen McDonald, M.D., Duluth.

John E. Harris, M.D., Head of Department of Ophthalmology, University of Minnesota, will present the Academy of Ophthalmology Lecture on "Use of Steroids in Ocular Disease."

A highlight of the meeting will be E. T. Bell, M.D., Minneapolis, who will present the Arthur H. Sanford Lecture. His title will be "A Clinical and Pathological Comparison of Chronic Glomerulonephritis and Malignant Hypertension."

At 2:00 p.m., Tuesday, there will be a Symposium on Urological Problems in Children, moderated by T. H. Sweetser, Jr., M.D., Minneapolis. Assisting will be C. A. Linke, M.D., Duluth, on "Urinary Tract Infections," and Cornelius Vermeulen, M.D., University of Chicago, on "Formation of Stones."

Moses Barron, M.D., Minneapolis, will conclude the Tuesday program, speaking on "The Current Status of Oral Hypoglycemic Agents."

Wednesday, R. N. Bieter, M.D., Head of Pharmacology, University of Minnesota, will speak on "New Drugs and Insecticides." Following Doctor Bieter, the Academy of General Practitioners are sponsoring W. B. Hildebrand, M.D., President of the State Medical Society of Wisconsin, who will speak on the "Relationship of the General Practitioner to the Specialist."

"Accidents in Children—The No. I Killer," will be the title that Tague Chisholm, M.D., Minneapolis, will use for his Wednesday morning presentation.

Later on Wednesday, "Animal Diseases Transmissible to Man" will be presented by Robert J. Anderson, Assistant Surgeon General, Chief Communicable Disease Center, Atlanta, Georgia. The Northwestern Pediatric Society Lecture will be given by Theodore C. Panos, Professor and Chairman, Department of Pediatrics, University of Arkansas, Little Rock, Arkansas.

The grand finale will be a Symposium on Staphylococcus Infections, moderated by Wesley Spink, M.D., University of Minnesota. Assisting in presenting this most important present-day subject will be Claude R. Hitchcock, M.D., Minneapolis; Robert I. Wise, M.D., Jefferson Medical College, Philadelphia, and Arthur H. Wells, M.D., Duluth.

The Annual Banquet will be held in the Ballroom of the Hotel Duluth at 7:00 p.m. on Tuesday, May 26. You will note that this year's speaker selection will mark a change of pace. We have indeed been fortunate to secure for this occasion, Dr. E. W. Ziebarth, Dean, Summer Session, University of Minnesota. "Russia Today" will be discussed by Dr. Ziebarth in his banquet address.

Benjamin B. Sweetser M.D.

President, Minnesota State Medical Association

Minnesota State Medical Association

106th Annual Meeting

Duluth, Minnesota—May 25-27, 1959

Preliminary Program

BUSINESS SESSIONS

Hotel Duluth

SATURDAY, MAY 23

2:00 P.M.—Council
English Room, Hotel Duluth
6:00 P.M.—Council Dinner
Parlor A, Hotel Duluth
8:00 P.M.—Council
English Room, Hotel Duluth

SUNDAY, MAY 24

8:30 A.M.—Council
English Room, Hotel Duluth
10:00 A.M.—Reference Committees
Rooms to be assigned
2:00 P.M.—House of Delegates
Ballroom, Hotel Duluth
6:00 P.M.—New Members and County Officers Dinner
Moorish Room, Hotel Duluth
8:00 P.M.—House of Delegates
Ballroom, Hotel Duluth

MONDAY, MAY 25

8:30 A.M.—Council
English Room, Hotel Duluth
12:15 P.M.—House of Delegates
Ballroom, Hotel Duluth

TUESDAY, MAY 26

8:00 A.M.—Committee Breakfasts
Rooms to be assigned
8:30 A.M.—Council
English Room, Hotel Duluth

WEDNESDAY, MAY 27

8:00 A.M.—Committee Breakfasts
Rooms to be assigned
8:30 A.M.—Council
English Room, Hotel Dulutb

SOCIAL EVENTS

SUNDAY, MAY 24

Golf Buffet and Cocktails

5:00 p.m. Northland Country Club

Dinner

New Members and County Officers Dinner
6:00 p.m. Moorish Room, Hotel Duluth

MONDAY, MAY 25

Dinners

Minnesota Academy of General Practice
6:00 p.m. Hotel Duluth. Tickets, $6.00, gratuity included.
Speaker: Miss Ann Landers, newspaper columnist, Chicago Sun Times Syndicate

Minnesota State Radiological Society
6:00 p.m. Dinner and Annual Meeting, Northland Country Club.
Speakers: J. E. Lofstrom, Detroit, Michigan, and Mr. Robert Morrison, Eastman Kodak Company

Open House

Minnesota State Medical Association
9:00 p.m. Ballroom, Hotel Duluth.
All physicians and their wives are invited to attend OPEN HOUSE as guests of the St. Louis County Medical Society.

TUESDAY, MAY 26

Luncheons

Minnesota Academy of Ophthalmology and Oto-Laryngology
12:30 p.m. Kitchi Gammi Club, Duluth. John E. Harris will speak on "Complications of Systemic Steroid Therapy."

Minnesota Society of Clinical Pathologists
12:15 p.m. Kitchi Gammi Club, Duluth

Medical Women's Association
12:30 p.m. Kitchi Gammi Club, Duluth. A special luncheon meeting has been planned for women physicians by the Alpha Epsilon Iota Medical Sorority. Two students in the Foreign Exchange Program will tell of their experiences—Sally McDonald in Europe and Dale Coventry in South America. Luncheon tickets are $2.50. Send reservations and checks to Dr. Elizabeth Bagley at 2306 East Superior Street, Duluth 5, Minnesota.

Dinners

Minnesota Society of Clinical Pathologists
6:30 p.m. Annual Dinner and Business Meeting, Duluth Athletic Club.

Minnesota State Medical Association
7:00 p.m. Annual Banquet, Ballroom, Hotel Duluth. Tickets are $6.00, gratuity included.
Speaker: Dr. E. W. Ziebarth, Dean, Summer Session, University of Minnesota.
Introduction of Woman's Auxiliary President: Mrs. M. F. Fellows, Duluth.
Presentations:
Fifty Club Certificates
Southern Minnesota Medical Association Medal
Distinguished Service Medal

WEDNESDAY, MAY 27

Luncheon

American Academy of Pediatrics, Minnesota Chapter
12:15 p.m. Luncheon at the Northland Country Club.

ROUND TABLES

Hotel Duluth—12:15 P.M.

MONDAY, MAY 25

Maternal Mortality Studies
Arranged by J. J. SWENDSON, Chairman of Committee on Maternal Health

Factors Responsible for the High Incidence of Clinical Coronary Atherosclerosis in the United States
HENRY I. RUSSEK, New York City

Present Day Knowledge of the Etiology of Some Common Types of Cancer
C. D. HAAGENSEN, New York City

TUESDAY, MAY 26

Immunization—Current Status
CAPTAIN J. R. KINGSTON, U.S. Navy, Washington, D. C., and others.

Thoracic Injuries
JOSIAH FULLER, Duluth

Automobile Injuries
MR. JOHN O. MOORE, Cornell University

Medical Farm Hazards—Silo Filler's Disease and Farmer's Lung
C. H. HODGSON, Rochester

Evaluation of Newer Hypertensive Drugs
JOHN G. FEE, St. Paul

Physiologic Variations in Body Fluids and Cellular Components—Practical Aspects
ELLIS S. BENSON, Minneapolis

Treatment of Blunt Trauma in the Abdomen
HOWARD R. SNIDER, Mankato

Shock Therapy
RICHARD C. LILLEHEI, Minneapolis

Obstructive Hearing Loss in Childen
J. D. SJODING, Mankato

WEDNESDAY, MAY 27

Oral Polio Vaccine
MAURICIO MARTINS DA SILVA, Washington, D. C.
HERALD COX, Pearl River, New York

Medical-Legal Evaluation of Traumatic Disabilities
S. S. HOUKOM, Duluth

Thyroiditis
A. W. SHEA, BERTON D. MITCHELL, Minneapolis

Work Evaluation in Heart Disease
ARTHUR C. KERKHOF, Minneapolis

New Antibiotic Drugs
ROBERT I. WISE, Philadelphia
WESLEY W. SPINK, Minneapolis

Inhalation Therapy
ALBERT H. ANDREWS, Chicago, Illinois

Nephrosis in Children
THEODORE C. PANOS, Little Rock, Arkansas

X-Ray Clinical Conference
JOSEPH J. ASTA, Duluth

Medical Functions of County Coroners
RAYMOND N. BEITER, St. Paul
JOHN I. COE, Minneapolis

Ocular Injuries and Emergencies
JOHN E. HARRIS, Minneapolis

GENERAL SESSION

Duluth Armory

MONDAY, MAY 25

Morning Session

Chairman: L. M. HAMMAR

A.M.
8:30 Visit Scientific and Technical Exhibits

9:00 WHAT'S NEW IN CARDIOVASCULAR DISEASE—Panel Discussion
Moderator, F. J. HIRSCHBOECK, Duluth
HENRY I. RUSSEK, Consultant in Cardiovascular Research, U. S. Public Health Service Hospital, Staten Island, N. Y.
JAMES W. CULBERTSON, Professor of Medicine, College of Medicine, University of Tennessee, Memphis, Tennessee
JOHN W. KIRKLIN, Rochester

10:15 INTERMISSION
Visit Scientific and Technical Exhibits

11:00 RUSSELL D. CARMAN MEMORIAL LECTURE
Breakthroughs in the Solution of the Stroke Problem
JAMES E. LOFSTROM, Chairman-Professor, Division of Radiology, Wayne State University, Detroit, Michigan

11:30 ROUTINE HOSPITAL ADMISSION X-RAYS AND OTHER TUBERCULOSIS CONTROL MEASURES
JOHN F. BRIGGS, St. Paul
Discussion:
J. P. MEDELMAN, St. Paul

Afternoon Session

Chairman: J. E. TWOMEY

P.M.
12:15 Round Table Luncheons

1:30 Visit Scientific and Technical Exhibits

2:00 SYMPOSIUM ON BREAST CANCER
Moderator, F. W. LYNCH, St. Paul
Surgery
CUSHMAN D. HAAGENSEN, Professor of Surgery, Columbia University, New York City. *Sponsored by Minnesota Division, American Cancer Society*
Chemotherapy
B. J. KENNEDY, Minneapolis
Radiation Therapy
DONN MOSSER, Minneapolis

3:15 INTERMISSION

4:00 MANAGEMENT OF STROKES—Panel Discussion
Moderator, IAN A. BROWN, St. Paul
Neurological Aspects
IAN A. BROWN, St. Paul
Physical Rehabilitation
GLENN GULLICKSON, Minneapolis
Vascular Surgery
DAVITT A. FELDER, St. Paul
Arteriography
JAMES E. LOFSTROM, Detroit, Michigan
Psychological Aspects
SHIRLEY HOLT MINK, PH.D., Minneapolis

GENERAL SESSION
Duluth Armory

TUESDAY, MAY 26

Morning Session

Chairman: WILLIAM D. COVENTRY

A.M.

8:30 Visit Scientific and Technical Exhibits

9:00 SYMPOSIUM ON MASSIVE GASTRO-INTESTINAL BLEEDING
Moderator, R. S. YLVISAKER, Minneapolis
Causes and Diagnosis
E. E. WOLLAEGER, Rochester
Medical Management
R. B. TREGILGAS, St. Paul
Indications for Surgery, Emergency and Delayed
LYLE J. HAY, Minneapolis
Types of Surgical Intervention
OWEN MCDONALD, Duluth

10:15 INTERMISSION

11:00 MINNESOTA ACADEMY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY LECTURE
Use of Steroids in Ocular Disease
JOHN E. HARRIS, Professor and Head, Department of Ophthalmology, University of Minnesota Medical School

11:30 ARTHUR H. SANFORD LECTURE IN CLINICAL PATHOLOGY
A Clinical and Pathological Comparison of Chronic Glomerulonephritis and Malignant Hypertension
ELEXIOUS T. BELL, Minneapolis

Afternoon Session

Chairman: FREDERICK M. OWENS, JR.

P.M.

12:15 Round Table Luncheons

1:30 Visit Scientific and Technical Exhibits

2:00 SYMPOSIUM ON UROLOGICAL PROBLEMS
Moderator, T. H. SWEETSER, JR., Minneapolis
Urology in Children
T. H. SWEETSER, JR., Minneapolis
Urinary Tract Infections
C. A. LINKE, Duluth
Formation of Stones
CORNELIUS W. VERMEULEN, Professor of Surgery (Urology), University of Chicago

3:15 INTERMISSION

4:00 MINNESOTA MEDICAL FOUNDATION LECTURE
Streptococcal Infections and Their Complications
LEWIS W. WANNAMAKER, American Heart Association Career Investigator and Professor of Pediatrics, University of Minnesota

4:30 CURRENT STATUS OF THE ORAL HYPOGLYCEMIC AGENTS
MOSES BARRON, Minneapolis

7:00 Annual Banquet—Ballroom, Hotel Duluth
Presiding: B. B. SOUSTER, St. Paul, President, Minnesota State Medical Association
Introduction of Woman's Auxiliary President: MRS. M. F. FELLOWS, Duluth
Presentations:
Fifty Club Certificates
Southern Minnesota Medical Association Medal
Distinguished Service Award
Russia Today
DR. E. W. ZIEBARTH, Dean, Summer Session, University of Minnesota

GENERAL SESSION
Duluth Armory

WEDNESDAY, MAY 27

Morning Session

Chairman: ROBERT N. BARR

A.M.

8:30 Visit Scientific and Technical Exhibits

9:00 New Drugs and Insecticides
R. N. BIETER, Minneapolis

9:30 Relationship of the General Practitioner to the Specialist
W. B. HILDEBRAND, President of the State Medical Society of Wisconsin, and Past President, American Academy of General Practice, Menasha, Wisconsin

10:00 Accidents in Children—The No. 1 Killer
TAGUE C. CHISHOLM, Minneapolis

10:15 INTERMISSION

11:00 Animal Diseases Transmissible to Man
ROBERT J. ANDERSON, Assistant Surgeon General and Chief, Communicable Disease Center, Department of Health, Education and Welfare, Atlanta, Georgia
Discussion: ROBERT K. ANDERSON, D.V.M., St. Paul

11:30 NORTHWESTERN PEDIATRIC SOCIETY LECTURE
Nutritional Requirements of the Neonate
THEODORE C. PANOS, Professor and Chairman, Department of Pediatrics, University of Arkansas, Little Rock, Arkansas

Afternoon Session

Chairman: ARTHUR M. OLSEN

P.M.

12:15 Round Table Luncheons

1:30 Visit Scientific and Technical Exhibits

2:00 SYMPOSIUM ON STAPHYLOCOCCUS INFECTIONS
Moderator, WESLEY W. SPINK, Minneapolis
Surgical Infections
CLAUDE R. HITCHCOCK, Minneapolis
Control of Hospital Infections
A. H. WELLS, Duluth
Resistance and Therapy
ROBERT I. WISE, Magee Professor of Medicine, Head of Department of Medicine, The Jefferson Medical College of Philadelphia

Woman's Auxiliary

37th Annual Meeting

PROGRAM

MONDAY, MAY 25

A.M.
9:00 Registration.....Mezzanine, Hotel Duluth
10:30 Executive Board Meeting....Kitchi Gammi Club
P.M.
1:00 Executive Board Luncheon..Kitchi Gammi Club
Tickets $2.25
3:00 Tea.....Tweed Art Gallery—U.M.D. Campus
Cars leave front entrance of Hotel Duluth for Tweed Art Gallery, 2:45-4:00 P.M. All visiting women are cordially invited to be guests of the St. Louis County Medical Auxiliary. (Through courtesy of the Art Department of the University of Minesota, Duluth Branch.)
9:00 Open House.....Ballroom, Hotel Duluth

TUESDAY, MAY 26

A.M.
9:00 Registration.....Mezzanine, Hotel Duluth
9:30 Annual Meeting
Arrowhead Room, Hotel Duluth
Open to ALL members of the Auxiliary.
Presiding—Mrs. Reuben F. Erickson, President, Minneapolis
Pledge of Allegiance—Mrs. William Finkelnburg, Winona
Auxiliary Pledge—Mrs. John W. Stuhr, Stillwater
"I pledge my loyalty and devotion to the Woman's Auxiliary to the American Medical Association. I will support its activities, protect its reputation and ever sustain its high ideals."
Address of Welcome—Mrs. Gordon Strewler, Duluth, President, St. Louis County Medical Auxiliary
Response—Mrs. Rodney Sturley, St. Paul
Presentation of Convention Chairman—Mrs. M. O. Wallace and Mrs. I. T. Clark, Duluth
In Memoriam Service—Mrs. A. M. Jensen, Brownton
Music: Violinist—Mrs. A. C. Hilding, Duluth
Reports
Election of Officers
P.M.
1:00 Annual Luncheon.....Ballroom, Hotel Duluth
Tickets $2.50
"The Physician's Wife — Generalist" — Mrs. Aaron Margulis, Santa Fe, New Mexico, National Committee Chairman on Mental Health.
"What the Seaway Will Mean to Minnesota"—Mr. Eugene R. Lambert, Former Mayor of Duluth
Installation of Officers—Mrs. H. H. Fesler, St. Paul
Installation of President and Presentation of President's Pin—Mrs. H. E. Bakkila, Duluth
Presentation of Gavel
Greetings from the New President—Mrs. M. F. Fellows, Duluth
Post-Convention Board Meeting
English Room, Hotel Duluth
7:00 Annual Banquet.....Ballroom, Hotel Duluth
Presiding—B. B. Souster, President, Minnesota State Medical Association
Introduction of Woman's Auxiliary President:
Mrs. M. F. Fellows, Duluth
Presentations:
Fifty Club Certificates
Southern Minnesota Medical Association Medal
Distinguished Service Award
"Russia Today"—Dr. E. W. Ziebarth, Dean, Summer Session, University of Minnesota

WEDNESDAY, MAY 27

A.M.
10:30: "Round-up Breakfast"....Duluth Women's Club
Tickets $1.50

Committees

General Arrangements—Mrs. M. O. Wallace, Chairman, and Mrs. I. T. Clark, Co-Chairman.

Reservations—Mrs. C. H. Christensen, Chairman.

Tickets—Mrs. Harry Klein, Chairman, and Mrs. William Swedberg, Co-Chairman.

Hospitality—Mrs. H. E. Bakkila, Chairman; Mrs. A. J. Bianco, Co-Chairman; Mrs. M. F. Fellows, Mrs. Joseph Bloom, Mrs. G. J. Strewler, Mrs. J. K. Butler, Mrs. J. E. Haavik, Mrs. F. J. Elias, Mrs. J. J. Asta, Mrs. V. A. Harrington, Mrs. Richard Bardon, Mrs. K. E. Johnson, Mrs. J. D. Barker, Mrs. F. H. Magney, Mrs. E. E. Barrett, Mrs. W. B. Martin, Mrs. R. T. Kelly, Mrs B. T. French, Mrs. B. Halper.

Transportation—Mrs. R. E. Nutting, Chairman; Mrs. P. S. Rudie, Co-Chairman; Mrs. H. G. Moehring, Mrs. J. L. Tuura, Mrs. H. J. Walder, Mrs. W. H. Grohs, Mrs. R. O. Bergan, Mrs. R. C. Pedersen, Mrs. A. W. Pasek, Mrs. A. E. Reardon.

Registration—Mrs. F. W. Conley, Chairman; Mrs. J. H. Peterson, Co-Chairman; Mrs. P. H. Marrone, Mrs. L. R. Gowan, Mrs. J. F. Schmid, Mrs. N. E. Tosseland, Mrs. A. E. Olson, Mrs. V. R. Krueger, Mrs. B. J. Terrell, Mrs. J. R. Chittum, Mrs. W. H. Parker, Mrs. K. E. Ahola.

Tea—Mrs. A. O. Swenson, Chairman; Mrs. S. N. Litman, Co-Chairman: Mrs. J. F. Schmid, Mrs. Henry Fisketti, Mrs. J. J. Dwyer, Mrs. B. J. Terrell, Mrs. J. H. Peterson, Mrs. George Cowan, Mrs. William A. Klein, Mrs. William B. Martin, Mrs. V. R. Krueger, Mrs. K. E. Johnson, Mrs. W. G. Strobel, Mrs. E. E. Barrett, Mrs. R. R. Juntunen.

Music—Mrs. A. C. Hilding, Chairman; Mrs. K. R. Fawcett, Mrs. J. P. Tetlie.

Executive Board Meeting and Luncheon—Mrs. J. E. Haavik, Chairman, and Mrs. R. O. Bergan, Co-Chairman.

Annual Meeting and Luncheon—Mrs. J. B. Moyer, Chairman; Mrs. J. C. Feuling, Co-Chairman: Mrs. M. M. Fifield, Mrs. K. A. Storsteen, Mrs. K. E. Latterell, Mrs. F. H. Dickson.

Flowers—Mrs. F .C. Jacobson, Chairman; Mrs. William Swedberg, Co-Chairman; Mrs. H. J. Jeronimus, Mrs. J. C. Feuling, Mrs. A. I. Balmer, Mrs. A. E. Olson, Mrs. Paul Van Puffelen, Mrs. J. M. Wolff, Mrs. C. F. Ahrens, Mrs. Chester Lund, Mrs. P. V. Halliday, Mrs. W. S. Pollard.

Pages—Mrs. A. L. Abraham, Chairman; Mrs. E. I. Parson, Co-Chairman: Mrs. Paul Van Puffelen, Mrs. Roy Pedersen, Mrs. Albert Balmer, Mrs. Robert Goldish.

Breakfast—Mrs. M. G. Gillespie, Chairman; Mrs. J. K. Butler, Co-Chairman; Mrs. J. J. Coll, Mrs. H. J. Walder, Mrs. G. C. MacRae.

Publicity—Mrs. I. V. Thomas, Chairman, and Mrs. J. C. Trautmann, Co-Chairman.

Exhibits—Mrs. K. E. Latterell, Chairman, and Mrs. O. G. McDonald, Co-Chairman.

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

AMERICAN MEDICINE-BLUE SHIELD PARTNERSHIP URGED

More than 300 people, half of whom were physician trustees representing Blue Shield Plan governing boards and officers of twenty state medical societies, attended the annual Blue Shield National Professional Relations Conference held in Chicago, February 9-11. The executive secretaries of some twenty-five state and county societies and 130 Blue Shield Professional Relations personnel comprised the balance of the conference group.

Minnesotans Present

Minnesotans attending included: B. B. Souster, M.D., President of the Minnesota State Medical Association, and J. P. Medelman, M.D., Councilor for the Fifth District. Minnesota Blue Shield representatives attending the conference were: R. R. Cranmer, M.D., President, Board of Directors, Minnesota Blue Shield; W. W. Yaeger, M.D., Board of Directors; P. G. Hoeper, M.D., Board of Directors; C. W. Moberg, M.D., Board of Directors; C. A. McKinlay, Board of Directors and Secretary; and E. C. Bayley, M.D., Board of Directors and Treasurer.

AMA President-Elect Commends Blue Shield

Dr. Louis M. Orr, of Orlando, Florida, President-Elect of the American Medical Association, in a keynote address commended Blue Shield for its "magnificent role" in developing the medical prepayment program, and urged "all members of the health team" to "recapture the pioneering spirit which was the foundation on which Blue Cross and Blue Shield were built."

"Let's stand together and stand united against the thrusts of big government into the medical care field," Dr. Orr urged. "And equally important, let's step up the current vigorous program to provide realistic positive approaches to all phases of health care among all people, young or old."

Referring directly to the needs of "senior citizens," Dr. Orr said he was "gratified that Blue Shield has been one of the first to pledge its all-out cooperation in working with the medical profession to do an effective job in providing medical care for the aged, especially the lower income group." He also commended Blue Shield's present accomplishments in developing a model contract for people over sixty-five, and progress in removing age limits on non-group enrollment.

Calling for an ever greater effort in this area, Dr. Orr said:

"The future of medicine and voluntary enterprise may well be determined largely by the extent to which Blue Shield and other voluntary financing mechanisms expand their coverage of the older citizens."

Dangers in "Social Security" Medical Care Cited

Dr. Orr further emphasized:

"For the first time in history, legislation of the For- and type would add health benefits to a Social Security program that now pays cash benefits based on the 'floor of protection' concept. This new principle would completely alter the nature of the program, and would open the door for evolution of a system of tax-paid health care for the entire nation. Indeed, it would establish the principle that provision of medical care for any segment of the population, or all of it, is a federal function."

The present Social Security program is expected to cost seven times as much in 1969 as it cost in 1937. This experience "plus the revealing stories of government medicine in European nations, is evidence enough that the initial tax for so-called 'free' medical care will be just a drop in the bucket compared to what will be required in ten or twenty years."

Better Blue Shield-Physician Understanding Needed

Another speaker before the conference was Dr. Donald Stubbs, Washington, D. C., Chairman of the Board of Directors of Blue Shield Medical Care Plans. Dr. Stubbs emphasized the urgent need of better understanding by all physicians of the job that Blue Shield was created to do.

"We've passed the point of no return in building voluntary health insurance in America," he said. "Without Blue Shield, the freedom of medicine would be lost. Blue Shield and the American doctor are identical

in their basic purposes. Medicine seeks to relieve human suffering, while Blue Shield stands for service at the fiscal level. For the doctor, Blue Shield represents a balance of his ethical ideals with the fiscal needs both of his patient and himself. Medicine has come to grips with the economy of our modern world through Blue Shield."

Blue Shield a Community Movement

Dr. Leland S. McKittrick, Boston, Chairman of the AMA Council on Medical Education and Hospitals, emphasized that Blue Shield must be recognized both by the profession and the public as a community movement. "We must have leadership in medicine that is imaginative, yet based on a complete understanding of the problems we are trying to solve," he said.

In his address concluding the conference, Dr. Frank L. Feierabend, Kansas City, President-Elect of Blue Shield Medical Care Plans, stressed that "Blue Shield must be a continuing answer to a continuing problem," and he appealed to the profession to "take the initiative, accept its responsibilities, and exert the leadership that the American people expect of their doctors."

Dr. Feierabend emphasized the need for Blue Shield to constantly improve its service to the public. This can be done only through the leadership of the medical profession.

He warned:

"Socio-economic chaos will result if Blue Cross and Blue Shield were to fail, and drastic changes in medical practice would follow if the voluntary nonprofit Plans fall short of the job they have to do.

"We must have a plan that will provide medical care to at least 75 per cent of the public either on a complete service basis, or on a cash indemnity basis which is accepted on the service principle by the medical profession."

Whenever medical care has been taken over by the State, Dr. Feierabend said, "money was the common denominator which governed the service received by the public." This has been shown in the English system, and again in the United States by our experience with Medicare.

Professional Relations Improvement Discussed

Discussion groups of physician trustees, medical society executives and professional relations personnel of Blue Shield Plans concentrated their attention on ways and means of improving professional relations between the Plans and their sponsoring medical groups, and of, getting the story of Blue Shield across to all the physicians.

These discussions covered the methods of maintaining liaison; ways of involving physicians in the guidance of their Plans; helping doctors to play a leading role in the constant improvement of Blue Shield, so it can meet the needs of patients more completely; the necessity for medicine itself to lead in developing policy, formulating schedules of medical payments, levels of income for service benefits, et cetera; and the importance of the individual doctor understanding the dynamics of Blue Shield and helping to conserve Plan resources as well as utilizing them most fully for the patient's benefit.

The discussion group of Plan professional relations personnel reported an emphatic agreement that *physicians,* individually and collectively, are the key to the success or failure of Blue Shield.

Texas Program Explained

C. Lincoln Williston, Executive Secretary of the Texas Medical Association, told the discussion group that Texas has developed a nineteen-point program of professional relations for Blue Shield, with the leadership being exerted by the Texas State Medical Association. The three objectives of the program are: (1) more effective liaison between the State Society and the Blue Shield Plan; (2) better understanding of Blue Shield by the 8,000 doctor-members of the State Society; (3) to implant the conviction that Blue Shield is the doctors' program.

In a word, the objective is "education; informing physician of existing problems, and securing their wholehearted cooperation in correcting them."

"We believe we have an effective portfolio of communication between Blue Shield and the Texas Medical Association."

Some elements of the program are: Medical Student Day program at three medical schools; Blue Shield as part of Orientation Program, mandatory for all new members; Representation of Blue Shield at all meetings sponsored by the State Society; Speakers for Blue Shield at annual PR Conference and Conference of County Society officials; Assistance to Blue Shield in presenting its story at each county society; Blue Shield news and reports in every issue of the state society journal—also editorials; Blue Shield advertisements in state journal; Publication by Blue Shield of a Membership Directory of Texas physicians; Promotion of Blue Shield enrollment through phy-

sicians; Encouragement of doctors to control overuse of Blue Shield services.

Michigan Committed to Modernized Concept of Medical Care Coverage

Relating the two-year history of the development of Michigan's new Blue Shield program, Max Lichter, M.D., Chairman of the Medical Care Insurance Committee of Michigan State Medical Society, pointed out that the Medical Society's action was guided by an intensive survey of public and medical opinion, which showed, among other things, that people are willing to pay a reasonably increased rate for additional benefits.

The Medical Society "committed itself to a modernized concept of medical care coverage. Michigan Blue Shield accepted the challenge"—and immediately developed a program along the lines requested by the Society.

COMMISSION ON MEDICAL CARE PLANS—UNFINISHED BUSINESS

A committee of the Minnesota State Medical Association has agreed to recommend that the report for the Study of Medical Care Plans of the American Medical Association presented at the recent AMA Clinical Session held in Minneapolis in December, 1958, be accepted, but emphasized the importance of the principle of free choice of physician.

At that meeting, the AMA House of Delegates decided to defer action on the report of the Commission on Medical Care Plans until the June, 1959, meeting in Atlantic City, New Jersey. However, the following statement was adopted by the AMA House of Delegates members.

We respectfully suggest to the constituent associations reviewing the report in the interim, that their attitude regarding the report will be clarified if they arrive at some decisions in regard to the following basic points:

1. *Free Choice of Physician*—Acknowledging the importance of free choice of physician, is this concept to be considered a fundamental principle, incontrovertible, unalterable, and essential to good medical care without qualification?

2. *Closed Panel Systems*—What is or will be your attitude regarding physician participation in those systems of medical care which restrict free choice of physician?

These suggestions acknowledge that the policy of the American Medical Association to encourage and support the highest quality of medical care for all patients remains unchanged. They question, however, whether attitudes toward the free choice of physician and the closed panel system may be undergoing evolutionary change.

In accordance with the recommendations of the AMA House of Delegates that the Board of Trustees invite the constituent associations to forward their replies to these questions to the Executive Vice President sixty days in advance of the June, 1959 meeting, the Minnesota State Medical Association appointed a special committee to study the report. The committee, in making its recommendations to the Council of the Minnesota State Medical Association, stated "it is the opinion of this committee that the principle of free choice of physician is to be considered a fundamental principle essential to the best medical care."

The report continued:

"We would like to emphasize strongly that we are opposed to so-called 'close panel plans' which limit the free choice of physician. We are cognizant of the fact that in certain areas these plans are operating successfully to fulfill an apparent need. In these areas, the 'free choice of physician' has been necessarily jeopardized. Nevertheless, it is our opinion that alternative plans can be developed through the co-operation of medical societies and the individuals involved which will obviate the need for these so-called 'closed panel plans.' Furthermore, we need to re-emphasize the inherent danger to the future quality of medical care which is likely to be associated with the further development and spread of these closed panel plans."

MINNESOTA LABOR VIEWS AMA MEDICAL CARE REPORT

Very much the center of attention in organized labor circles, is the pending action which the AMA is expected to take at its 1959 Annual Meeting in Atlantic City, New Jersey, in June.

Recently, an editorial commentary on this important subject appeared in the *St. Paul Union Advocate* under the feature heading, "Looking Things over with Lock."

For your consideration, the following excerpts from that article have been reproduced as follows.

"The old American Medical Association is just as reactionary today as it was when Morris Fishbein dominated its conventions, its official organ, and its very thinking.

"And we make this assertion in the face of a recent top AMA commission's advice that the organization should adopt a 'judicious, tolerant and progressive attitude' toward prepaid medical care plans.

"Such a proposal, were it to be adopted by the 1959 annual convention of the AMA next June, would mark a drastic change from the association's present open hostility toward any and all plans not totally, completely controlled by members of the doctors' union. . . . The AMA envisions socialized medicine in every prepaid health plan ever put into operation; it fought the enactment of the federal social security law because its hard-shelled leaders considered it as just another wave in the direction of socialized medicine, and it will continue to see bogeys in everything designed to correct the very iniquities the medical trust has foisted on the great mass of suffering humanity.

"If socialized medicine ever comes to the USA, it will be because of the intolerance, the greed, the narrow-mindedness and the insolent conceit of the men who dominate the AMA."

FORAND BILL—A LA 1959

The Forand Bill (1959 version) was introduced in the House of Representatives, February 18. The proposed measure has undergone a certain amount of stream-lining. Provisions in the bill introduced in the House by Representative Aime Forand, Democrat from Rhode Island, now includes permitting surgical services to be performed by other than board-certified members. Financing the program would be accomplished by increasing social security taxes beyond increases already planned, by one-quarter of 1 per cent for both employe and employer and three-eighths of 1 per cent for the self-employed starting in 1960.

In addition, Mr. Forand has indicated that he intends to explore the possibility of (1) paying for diagnostic services, such as x-rays and laboratory tests, on an out-patient basis, and (2) including benefits for home nursing care through responsible agencies as visiting nurses association, hopitals or local health departments.

He points out:

"The AHA has recognized the need for some type of federal action and has been exploring alternatives. . . . The American Medical Association has also acknowledged the need for vigorous action along new lines and urged its member societies to explore and support private programs that will help to avoid federal legislation."

At this time, no definite date for hearings on this measure which proposes to use the social security system to provide hospitalization and surgical services for those eligible for OASI insurance benefits, have been scheduled.

DINGELL BILL HAS FAMILIAR RING

Senator James E. Murray, Democrat from Montana, and Representative John D. Dingell, Democrat from Michigan, have reached their perennial conclusion that compulsory national health insurance must be adopted to fill a need because the voluntary system "has failed entirely to reach a third of the people."

The duet of Wagner-Murray-Dingell fame has expressed this conclusion in conjunction with the introduction of a bill similar to that introduced by that trio some fifteen years ago.

According to the provisions of the suggested legislation, employers and employes would share the cost with the latter contributing a maximum of ninety dollars a year for complete health care of themselves and dependents.

In the past, measures authored by these proponents of compulsory national health insurance have received little attention. However, some observers feel that the current emphasis of Congress on health legislation might afford this measure serious consideration. A number of factors may make the Murray-Dingell Bill a strong 86th Session contender. Namely, in financing features, the bill does not rest on taxation mechanism, a deliberate omission to heighten chances of its being referred to House Commerce Committee rather than Ways and Means Committee.

Also, conveniently and strategically, Representative Dingell is a member of the former committee. Senate handling of the measure will probably be by the Labor and Public Welfare Committee in which Senator Murray ranks next to the chairman, rather than the Finance Committee.

SENATOR HUMPHREY IS ALSO HEALTH BILL MINDED

The Humphrey Bill (S.1511) a counterpart of the new Forand Bill, providing government paid surgical, hospital and nursing home care for beneficiaries of OASI, was recently sent to the Finance Committee. States Senator Humphrey on behalf of his measure:

"We in this great and wealthy country have a social and moral obligation to provide adequate means whereby the elderly may (be) free of constant anxiety over what will happen in time of serious illness."

THE MINNESOTA STATE MEDICAL ASSOCIATION FOUNDATION IS FORMED

The Minnesota State Medical Association Foundation, a non-profit corporation, has been formed by the Council of the Minnesota State Medical Association. The purposes of the corporation are as follows: (a) To engage in, advance, promote and administer charitable, educational and scientific activities and projects; (b) To aid, assist and contribute to the support of corporations, associations, and institutions, gifts to which are deductible from the income of a corporation under the provisions of the Internal Revenue Code; (c) To establish or create and to maintain, promote, endow and aid, any such corporation, institution or association; and (d) To render financial assistance to such members of the medical profession and their families and to such families of deceased members of the medical profession as may be indigent and as may be deemed worthy of such aid by the corporation.

IMPROVED GROUP LIFE INSURANCE PLANS ARE AVAILABLE TO MEMBERS

The Council and the Insurance Liaison Committee has announced major revisions in our group life insurance program, providing much greater benefit with broader policy provisions. The plan will now be available to all eligible members throughout the state. In addition, *Waiver of Premium* and *Double Indemnity* are now included; and the amount of coverage has been doubled, with very favorable premium adjustments.

Further, it is a "participating" policy, with dividends payable according to the experience of the group. Presently insured members will be given the privilege of conversion.

The Northwestern National Life Insurance Company remains the underwriter, and Charles O. Finley and Company have been named administrators.

Watch for additional detailed information regarding this outstanding opportunity.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

PHYSICIAN'S LICENSE SUSPENDED FOR FIVE YEARS FOR NARCOTIC VIOLATIONS

On February 20, 1959, the Minnesota State Board of Medical Examiners suspended for a period of five years the medical license held by Dr. Max M. Tenen, forty-two, 9104 Raviller Drive, Downey, California. In a citation issued by the Board for the revocation of his license, Dr. Tenen was charged with having habitually indulged in the use of demerol, dolophine, dilaudid and morphine sulphate, and with having illegally issued certain prescriptions for dilaudid in the name of another person, the prescriptions being later compounded and the drugs thereby obtained illegally diverted by him to his own use. It was also alleged in the citation that Dr. Tenen had entered a plea of guilty in the Municipal Court of Downey Judicial District, Los Angeles County, California, to a violation of the statues of the State of California regulating narcotics.

Although Dr. Tenen did not appear at the hearing before the Board on February 20, part of the evidence presented in support of the citation disclosed that on November 15, 1957, he was placed on two years' probation by the Court at Downey, California, for issuing false and fictitious prescriptions and for dispensing narcotics without making a record of each transaction showing the name of the patient, the date, the character and quantity of narcotics involved, and the pathology and purpose for which the narcotics were administered and dispensed. Following his conviction in Municipal Court, a proceeding was instituted against Dr. Tenen in regard to his medical license by the California Board of Medical Examiners and in an order dated August 29, 1958 the Board placed him on probation for a period of five years.

Dr. Tenen, who was born in Warsaw, Poland, on May 10, 1916, was awarded an M.D. degree by the University of Minnesota on June 13, 1942. He became a citizen of the United States upon the naturalization of his father on December 16, 1926, in Minneapolis. Since being licensed in California in 1945, Dr. Tenen has been located at Lynwood, Compton, and Downey, California.

THE POSTCHOLECYSTECTOMY SYNDROME

As a result of the reexamination of 220 patients who had undergone operations on the gallbladder not less than a year and a half earlier, the author presents a thoroughgoing analysis of the results. He emphasizes the importance of radiomanometric study during the operation, which, together with cholangiographic investigation, makes it a rare occurrence for stones to be left behind in either the cystic duct or the common bile duct. Overlooked stones and pathologic conditions in the bile ducts therefore command less concentrated attention from the surgeon than to hepatic changes that existed prior to operation, especially cholangitis, interstitial hepatitis and the various types of cirrhosis. Since these diseases are most frequently due to long-standing disease of the gallbladder, they should prove preventable, in many cases, by surgical intervention before complications occur. Absolute contraindications, such as extreme age, arteriosclerotic dementia and extraordinary obesity, are still valid except when the severity of the symptoms make operation unavoidable. — E. KAISER, M.D., *Journal of International College of Surgeons*, 31: 80-86 (Jan.) 1951.

History of Medicine in Minnesota

A MEDICAL HISTORY OF MEEKER COUNTY PRIOR TO 1900

HAROLD E. WILMOT, M.D.

Litchfield, Minnesota

(Continued from January issue)

Dr. George Newlands, regular, practiced in Litchfield at least as early as 1886, at which time his professional card appeared in the *Litchfield News Ledger* October 14 as physician and surgeon.

Dr. Rosenthal reports that he graduated from the Royal College of Physicians and Surgeons at Kingston, Ontario, probably also known as Queens Uinversity, Canada, 1879. He was licensed in Minnesota, December 31, 1883, as a regular physician, and his number was 656. The directories of 1890 show him in Litchfield, Minnesota, Meeker county, and in 1895 in Seattle, Washington. His death occurred there October 22, 1951, and was due to meningitis.

His first appearance in Meeker county is portrayed by his professional card appearing in the *News Ledger,* September 14, 1882:

"Drs. Kennedy and Newlands
Physicians and Surgeons"

We again find his presence in a courtesy card, January 4, 1883:

"Dr. George Newlands—Office on No. Marshall Ave.
Two doors So. of Methodist Church"

According to the *News Ledger* of November 15, 1883, he attended Ida Schnell who died.

W. R. Berens personally tells me he was vaccinated by him for smallpox in 1884 or 1886. According to the *News Ledger* he assisted in the operation on a skull fracture case about January 19, 1882, and that the patient died. April 12, 1883, we find his rooms moved over the post office. April 3, 1883, we find the allowance for care of county patients allotted to him by Meeker county in the amount of $184.50.

News Ledger, July 17, 1884—"Dr. George Newlands of this city was married to Miss Lizzie Burdick (a local girl—Ed.) at St. Paul, July 8th. Messrs. George Becker and Hamlet Stevens and Mesdames Ross, Cootes, Jackson and Miss Moore were present from this city. The happy couple started the same day for the doctor's old home at Kingston, Canada. They will return to this city in a few days, when the numerous friends will have an opportunity to extend congratulations."

Independent, May 12, 1885—"The arrival of a new daughter made Dr. and Mrs. Newlands happy on May 6th."

Independent, May 16, 1885—"Dr. Newlands was elected to be a delegate to the Minnesota State Democratic convention."

We find Dr. Newlands in April, 1886, 'building a new home and plastering under the roof."

Independent, January 25, 1887—"Infant son of Dr. Newlands died of lung fever."

Independent, March 19, 1889—"Dr. Newlands returned from a trip to the Puget Sound country and seemed to be favorably impressed with same."

News Ledger.—"Dr. Newlands will leave today for Seattle. His family will remain here for the summer."

Dr. Newlands was slender, dark, had a short beard, carried himself with dignity; was busy, well thought of, well dressed; had a well kept home; and drove nice horses. He belonged to the Episcopal church and was a Mason.

Dr. Enoch A. Baum.—We first hear of Dr. Baum in the *News Ledger* of February 7, 1884—

"E. A. Baum, well known in the neighborhood where he lives, to possess a sure cure for diphtheria, and also to be one of the most successful opticians in the state, will visit Litchfield the last week in March, and stay several days, at which time he will teach parties how to treat diphtheria and will treat any case of sore eyes, or other chronic disorder. For further particulars, inquire at this office. References: Jas Nelson, Thos. Ryckman, Staples Bros.—Manannah."

The Minnesota Medical Directory reports him licensed by exemption September 2, 1884, by affidavit of 1884; located at Litchfield where he continued to practice.

The A.M.A. reports that he died at seventy-seven years of age in Fergus Falls State Hospital after a six-year-illness with brain disease. He was buried in Lake Ripley cemetery June 23, 1908; age given as seventy-seven; cause of death: anemia.

A son, Clarence, visited him frequently while he was in Litchfield, and an M. E. Baum, a son, was proprietor of the Litchfield House for years, starting about 1885.

Independent, October 9, 1888—(Greenleaf News). "Dr. Baum was in town a few days last week."

News Ledger, October 18, 1888—The first appearance of his courtesy card reads as follows: "Dr. E. A. Baum will treat all chronic diseases, sore eyes, female weakness, cancers in all forms, disease of the skin and venereal diseases. May be found at the Litchfield House the first week in each month."

This card not seen after October 1, 1889. However Dr. Baum signed death reports as attending physician in 1892, 1893, 1894, and 1897.

News Ledger, April 8, 1897—"Dr. Baum is sixty-six years of age and last Monday he was flying around town like a young colt let out to pasture, all on account of a baby boy that arrived at his home the night before and who will call him Dad in the future."

Independent, July 11, 1899—"Criminal Operation. Clara Olson dead from that cause says jury. Dr. E. A. Baum charged with being guilty of the crime.

"Last Wednesday morning at the rooms occupied as a residence and office by E. A. Baum in the Snell block, occurred the death of Clara Olson, daughter of Christian Olson of Acton town under circumstances that led to an examination and inquest by Coroner William Hildebrandt and a jury.

"A post mortem examination was made by Drs. Bissel, Robertson, and Chapman.

"In their opinion, an operation for abortion had been performed. Dr. Baum claims he was treating the girl for venereal disease. Dr. Baum has been implicated in one similar case heretofore in which the girl recovered. He is not a practitioner of any regular school of medicine but has been practicing for a good many years. He is an old man and has been living in the county since its early days.

"There has been no arrest as yet.

"The Verdict: 'Said Clara Olson died at the residence of E. A. Baum in Litchfield, Meeker county, Minnesota, on July 5, 1899, as the result of a criminal operation known as abortion, by the hands of E. A. Baum.' Signed (Jurors—names listed)."

Independent, July 18, 1899—"Dr. Baum Arrested.

Coroner Hildebrandt swore out a complaint against Dr. Baum last week and he was taken before Justice Bissel (not Dr. Bissel—Ed.) and admitted to bail in the sum of $500.00. Preliminary hearing for next Friday, 21st."

Independent, July 25, 1899—"Accused bound over to Grand Jury. Bail fixed at $1,000. Defendent did not go on the stand in his own behalf."

Independent, November, 1899—"Plea Not Guilty. No Trial Yet."

Independent, February 27, 1900—(Court Cases). "Case of E. A. Baum was called. A jury secured about noon and the evidence on both sides took until the following noon. The case went to the jury in the afternoon, and they were out until the next morning when a verdict of 'Not Guilty' was the result of their deliberations."

In 1902 a professional card is as follows: "Dr. E. A. Baum—Specialty Female Troubles."

Dr. Baum was a small man with scanty beard; he had a poor practice, carried a small doctor's bag, and travelled mostly on foot. He was a Presbyterian.

Drs. C. A. and A. P. Woodward.—

News Ledger, December 18, 1884—"New Doctors. Drs. C. A. and A. P. Woodward, homeopathic physicians, have located in Litchfield for the practice of their profession. Dr. C. A. Woodward has for the past seven years been located at Glencoe, and is doubtless known to some of the southern residents of this county. His brother, A. P., has for ten years been located at Cannon Falls. After looking the country over, they have decided upon this point to enter into the practice together and their office in the future will be over J. L. Wakefield's store. They are men of gentlemanly appearance and have each had years of experience. There is a large scope of country surrounding Litchfield that has no homeopathic representative and doubtless there are many who have faith in that branch of the practice of medicine who will heartily welcome their coming."

News Ledger, December 18, 1884—"While at Wahpeton a short time ago, Drs. Woodward were requested to perform a surgical operation upon a boy who had his leg crushed by a threshing machine. They amputated the leg and in so doing, Dr. C. A. got his right hand blood poisoned and came near losing his life. It began to affect his arm, but they succeeded in stopping its further progress. He is now carrying the injured hand in a sling."

News Ledger, December 18, 1884—(Professional Card)

"C. A. Woodward A. P. Woodward
Woodward Bros.
Homeopathic Physicians and Surgeons
Diseases of Women a Specialty
Office over Wakefield's Store"

Independent, February 3, 1885—"Woodward Brothers, the homeopathic physicians, who established themselves here a few weeks ago, have already decided to leave. One will locate in Glencoe and the other in Hutchinson. They will depart today."

News Ledger, May 30, 1889—(Dassel News). "Woodward Bros., homeopathic physicians, advertise to be in Dassel the fore part of each week occupying parlors in the Dassel House."

Dr. R. H. Wood was listed in Forest City by the Medical Register in 1886. No news items are available. Perhaps he never arrived.

Dr. J. H. Bowers.—The first note we have on Dr. J. H. Bowers, a homeopath, is found in the *Litchfield Independent* of July 14, 1885:

"Dr. J. H. Bowers of La Porte, Indiana, an experienced physician of the homeopathic school was in town one day last week looking over the ground with the view of a permanent settlement. The doctor seems to be a fine gentleman and a man of considerable experience. He is well pleased with the town and country and, in all human probability, will be with us to stay ere long.

The doctor has written since that he will be in Litchfield about July 22 or 25 to make it his permanent home. Will probably move into Mrs. Hart's home on the north side of the park."

Courtesy cards appeared in both papers:

"J. H. Bowers, M.D.
HOMEOPATHIC PHYSICIAN
Litchfield, Minn.
Office at residence northwest corner of Marshall Ave. & 4th St."

April 27, 1886—*Litchfield Independent Review.* "Dr. Bowers was called to Herman, Minnesota, to attend ill child."

September 12, 1886—*Litchfield Independent Review.* "Dr. Bowers moved into house three doors north of Episcopal church."

April 26, 1887—*Litchfield Independent Review.* "Dr. J. H. Bower's wife's father, Nathaniel *Pullman,* died suddenly in Minneapolis. He had made many inventions in constant use in the railway business." (Pullman Sleepers?)

There were other notes in the papers on moving into a new house in 1888 and attending various patients.

Then the *Independent* of August 14, 1888, states:

"Dr. J. H. Bowers has decided to leave Litchfield and locate in Menomonee, Wisconsin. He is a reliable man and a good citizen and we are sorry to see him leave. Mrs. Bowers will remain a month or two."

News Ledger, August 16, 1888—"Dr. J. H. Bowers left last week for Menomonee, Wisconsin, where he expects to establish himself for the future. The doctor is counted among the best of the homeopathic school, is a good citizen and the well wishes of Litchfield follow him to his new home."

Dr. Bowers was listed in the medical record in Litchfield as of 1890 but no doubt moved before its publication. He was also listed in Herman, Minnesota, during the same year but marked as having removed from the state.

In 1895 and 1905 he was listed in Renville, Iowa. In 1909, no address listed. He died July 10, 1920, cause unknown.

Dr. William J. Bahnsen.—On Dr. Bahnsen, regular, the *Independent* of July 21, 1885, carries this item in Cedar Mills News:

"Dr. W. J. Bahnsen of Chicago arrived last Friday. His office at present is in the old store building. The doctor comes well recommended."

Dr. Rosenthal has uncovered a very interesting tale about this man. He was born July 30, 1858, in Hamburg, Germany, and came to the United States at the age of seven, living at first in Rock Island, Illinois. After getting some education, he tried his hand in some mercantile establishments. He started his medical education at the Medical College in Minneapolis where he remained one term. Then he attended a course of lectures at the Chicago College of Physicians and Surgeons. Following that, he took a course at Bellevue Hospital in New York. He returned to Chicago and graduated with honors from the Chicago Physicians and Surgeons College in 1885.

He practiced in Cedar Mills, Meeker county, about one year.

Independent, July 28, 1885—"Dr. Bahnsen dressed a wounded finger."
"Dr. Bahnsen took care of Eves and they are getting well."

Independent, September 8, 1885—"Dr. Bahnsen had a meeting appointed for those af-

flicted with eye troubles, but could not attend to the cases as some ordered instruments and expected assistance did not arrive in time."

Independent, December 1, 1885—"Dr. Bahnsen, the physician who stayed with us the last three months, left on Thursday for Chicago to complete his studies as an eye and ear specialist, and Dr. Vollmer came from Ohio to take his place as a resident physician. Dr. Vollmer is a German and comes highly recommended."

Dr. Rosenthal states that following his brief stay in Meeker county, Dr. Bahnsen went to Europe where he studied and worked for about one and one-half years. He received diplomas from the Universities of Berlin and Heidelburg. He settled in Fisher, Polk county, in May, 1887. He was able in six months to establish a fine reputation in Fisher, especially as a surgeon. He had a fine personality and was a "natural born physician."

His untimely death was caused by being shot in the back of the head as he was getting on the train after making a country call near Fisher, in August of 1890. At that time he had established his practice in Crookston. The assassin was apparently freed, and the reason for the attack is unknown. It was thought that he was taken after the assault to Grand Forks, North Dakota, and died there, but no death reports are available.

Dr. Bahnsen was the third of nine children and was survived by six siblings and his widow, who was Annie Elbie before her marriage to the doctor. There were no children.

Dr. Stiles S. Squires.—A news item of August 23, 1888, states: "Dr. S. S. Squires, a homeopathist, has located in this city and will fill the place made vacant by the departure of Dr. Bowers. Dr. Squires is a man of middle age, has had years of practical experience and appears to be a gentleman thoroughly posted in his work. His office will be at his residence in the Hart home, northeast corner of Central Park." His professional card appears in the same issue.

He was a member of the Prohibition Party and chairman of the executive committee of the same for Meeker county. He was a delegate to the State Convention of the Prohibition Party.

He made trips to Manannah on Tuesday and Friday of each week in 1899.

He was licensed under the "Affidavit of Years of Practice Prior to 1887" and listed in Litchfield in 1898 in the Minnesota Directory. He was listed in the A.M.A. Directories 1886 to 1890 at Tracy, Lyon county, Minnesota. He was last listed at Newport, Washington, up until 1908.

The last appearance of his professional card appeared here in the *Litchfield Independent* on February 6, 1900.

He had a son who ran a confectionery store here.

He was described as short, gray haired, and wore square "whiskers." He belonged to the Methodist church and was quite a singer, and is reported to have been buried in Ripley cemetery, though I found no listing in the cemetery association records.

Dr. J. Vollmer.—

Independent, December 1, 1885—"Dr. Vollmer arrived in Cedar Mills to take over the practice of Dr. Bahnsen who left for further study. He came from Ohio, was of German extraction, and probably educated in Germany. His work was much appreciated by his neighbors and patients."

Independent, December 8, 1885—"Dr. Vollmer, assisted by Dr. Bahnsen, has performed a successful operation on Mrs. R. Martin, taking a large tumor out of her side. Mrs. Martin is doing as well as circumstances permit."

Independent, January 19, 1886—"Dr. Vollmer, unused to the ways of a cutter, upset in a snow bank and the horse ran away, but he hired a bobsled and finished making his call."

Independent, April 6, 1886—"Dr. Vollmer was thrown from his buggy and badly hurt."

Independent, July 13, 1886—"Dr. Vollmer treated a patient with a crippled foot."

Independent, September 21, 1886—Speaking of the county fair: "And in some other departments, our productions are worth looking at, not the least noticeable is the nice bracket work of Dr. Vollmer. His bird cages, work boxes, picture frames, and other work are very fine. He is undoubtedly very industrious as he gives excellent satisfaction as a physician."

Independent, October 9, 1888—"It has now become a certainty that we are to lose our doctor and his family. They will move to Hutchinson this week. We heartily recommend him to anyone in need of a physician. His intelligent and accomplished wife will be greatly missed in the social circles."

Dr. Edwin A. Skaro, regular, came to Dassel from Minneapolis in 1886 but returned to Minneapolis in 1888. From word of mouth, he exhibited some peculiarities of personality and found Dassel unsuited for him.

Independent, March 22, 1887—(Courtesy Card)

"Dr. E. A. Skaro
Physician and Surgeon
Scandinavian Doctor
Office above Lion Drug Store
Dassel, Minn."

This card was missing on and after June 7, 1887.

Transcripts of Minnesota Medicine list him with Minnesota License No. 1320, issued March 12, 1887, and that he was a graduate of the Minnesota Hospital College of 1887. He was further listed in Minnesota Medical Directories in Dassel 1890 and Minneapolis in 1903 and 1909. He signed a death certificate in Meeker county in 1890 and 1899. He was not listed by the A.M.A.

Dr. William Hambroer, Eden Valley, graduated in 1883 from Bennett College of Eclectic Medicine and Surgery, and evidently came to Eden Valley soon after. He was of German extraction. Polk's Medical Directory listed him in Eden Valley in 1893. His signature appears on death certificates in 1889, 1891 and 1896.

In January, 1899, a news item describes his having finished three furnaces: one for his office, one for his home, and one for the Warner Hardware. Evidently he was something of an iron worker, and did this work as a side line.

Another news item of April, 1899 states that the doctor would need an assistant at present.

In April of 1899 we read that he "sold his residence and all his drugs, patent medicines, etc., to Mr. Williams, a druggist, who will take possession in the near future. The doctor will remain in Eden Valley and take life easy."

He retired in favor of Dr. Ridgeway in 1899 but continued to act in some capacity, for we read in February, 1903: "Dr. Hambroer, Health Officer of Eden Valley Village and Manannah township, publishes in the *Eden Valley Journal* a card prohibiting the holding of dances anywhere in the township on account of the prevalence of smallpox."

Dr. John Howard Kauffman.—As previously noted, Dr. Kauffman purchased Dr. McCollom's practice in Dassel in January of 1887, and remained there until 1911 when he removed to Currie, Minnesota.

He was born in Martinsburg, West Virginia, October 28, 1859. He was the son of Henry and Mary (Wilkins) Kauffman. His father for many years operated a drug store in Newburgh, Cumberland county, Pennsylvania. He received his early education locally and worked in his father's store, and on attaining his majority was taken into partnership by his father. In the fall of 1881 he entered Jefferson Medical College at Philadelphia, finishing two terms there, then entering the College of the City of New York. He returned to Newburgh, Pennsylvania, and practiced and conducted the drug business until 1887, when he sold out intending to start practice in Dakota Territory. On reaching Minneapolis he changed his mind and went to Dassel.

Excerpts from the Municipal Progress, 1899, give us this: "Dr. Kauffman enjoys an extensive patronage throughout this and adjoining counties; he is a thorough believer in the future of Dassel and is the owner of some of the most valuable and desirable business and residence property in the village. He is a worthy example of the medical profession, an esteemed citizen, a note worthy practitioner, and an ardent friend to social and municipal progress. Although a most busy man, Dr. Kauffman finds time to promote the best interests of Dassel. He is a 32nd Degree Mason and a Shriner and a member of I.O.O.F., M.W.A., and K.P. fraternities."

He possessed Minnesota Medical License No. 1400, dated May 11, 1887 (by diploma), and Minnesota Basic Science Certificate No. 2466, dated January 10, 1927 (by previous licensure). He is listed in our medical directories in Dassel from 1890 through 1909, and in 1928 in Currie, Minnesota.

Independent, 1887—"Dr. Kauffman is caring for diptheria cases."

Independent, April 18, 1889—"Dr. Woodward has left Dassel for Minneapolis. Dr. Kauffman is moving over the store of Oslund and Leighton."

News Ledger, August 8, 1889—"We learn that Mr. Steel who is studying with Dr. Kauffman will, when he completes his college course, become a partner of Dassel's popular doctor. Mr. Steele seems particularly adapted to that profession."

Independent, April 3, 1888—"Dr. Kauffman's wife arrived from the East."

News Ledger, April 5, 1892—(Courtesy Card)

"Dr. John H. Kauffman
Physician and Surgeon
Dassel, Minn."

News Ledger, May 27, 1897—"Dr. J. H. Kauffman is attending a typhoid patient."

News Ledger, March 9, 1898—"Dr. J. H. Kaufman was elected president of the City Council at Dassel at the recent election."

News Ledger, April 5, 1898—"Dassel merchants are fast selling out. Week before last, R. F. Case, druggist, one of the oldest businessmen of Dassel, sold his whole outfit to Dr. J. H. Kauffman who immediately took possession. Consideration, $5,500, including dwelling house as well as store."

Dr. Kauffman has been described as fine looking, single, a great beau, highly thought of. Gossip has it that his office girl committed suicide over him. Certainly he was married, inasmuch as the arrival of his wife is noted in the newspaper in 1888. There were no children.

Dr. Kauffman died January 7, 1933, in St. Joseph's Hospital, Saint Paul, at seventy-four years of age from mesenteric thrombosis and intestinal obstruction of two days' duration. Funeral services were under auspices of Ancient Landmark Lodge No. 5 A.F. & A.M. of Saint Paul, and interment was made in Oakland cemetery, Saint Paul.

(To be continued in the July issue)

The Art of Medicine

PR

Carl H. Woyke, B.A.
Editor

WANT 1959 PR SUGGESTIONS? HERE ARE A FEW

The AMA recently listed as top priority for 1959, the following practical public service projects. The suggested projects have been designed to approach the public on a grass-roots basis. Suggestions for 1959 county society and/or individual physician participation include the following.

Aging—Medicine's greatest problem right now is that of financing medical care for the patient over sixty-five. It is imperative that every society begins work on the problem immediately before government legislates an undesirable remedy. Each doctor can start in his own office by following the House of Delegates' suggestion that physicians help develop special insurance for those over sixty-five by accepting a level of compensation for medical services rendered which takes into consideration the needs and financial resources of the aged. Medical societies are urged to establish committees on aging which work closely with society PR committees and community groups. Societies will find helpful ideas for forming their aging program in AMA's "Medicine's Blueprint for the New Era of Aging."

Legislation—Societies should keep in mind that many of the long range goals of medical public relations will be realized by the enactment of legislation. So legislative groundwork must be laid from the very beginnig. Invite your government representatives to a society meeting this year to discuss up-coming bills in the medical field. Keep in constant touch with them throughout the year to let them know your society's views.

Food Faddism—Health education is a vital part of medical public relations. This year AMA can supply your society with a complete set of materials to help you expose the food fallacy racket. Order a campaign kit from The Minnesota State Medical Association.

Automobile Seat Belt Campaign—Experiments show that deaths resulting from automobile collisions could be drastically reduced if more people bought and used seat belts. This spring the National Safety Council, U. S. Public Health Service and AMA will sponsor a drive to promote the use of seat belts. Your society will be notified of available campaign materials soon, so plan to spearhead a drive in your community.

Co-operation with Labor Unions—Many unions are actively engaged in public service projects close to the interests of medical societies. By volunteering your society's support in these programs and enlisting union co-operation with such projects as seat belt and food faddism campaigns you may pave the way to better rapport over more controversial issues.

Athletic Injuries Clinics—Although the sports field is usually the most dangerous spot on the high school campus, proper preparation for the care of injured athletes is often conspicuous by its absence. To mend this gap in local school programs medical societies are urged to meet with coaches and school administrators to discuss proper treatment of athletic injuries. AMA's booklet "Protecting the Health of the High School Athlete" is a helpful guide for setting up an injuries clinic.

Disciplinary Structure—No profession can build stature without first accepting responsibility for its members' behavior. That's why no society PR program is complete without an effective disciplinary structure. So take time out to re-evaluate your society's mediation committee or disciplinary structure. Is it honestly fulfilling its original function? Is the public aware of this service?

Press Relations—Resolve this year to call on the editor of your local paper and interest him in at least one story about the good things doctors are doing in your town. Remember—most news is sent to the newspaper so your story stands the best chance of being printed if you bring your idea to the editor in person. Talk the matter over with him, he is usually a ready listener.

Free Choice of Physician—AMA's campaign to educate the people on the advantages of choosing their own family physician will continue full steam ahead. Those societies wishing to promote the campaign in their own communities may order a kit of promotional materials from the Minnesota State Medical Association.

Additional possibilities for county society projects suggested are: *Disaster Planning; Poison Control; Study of Better Business Management Practices for Doctors' Offices; Assistance to the Mentally Ill or Alcoholic.*

Your State Association is ready to help you put these projects in action. Whenever additional assistance is desired, our organization has at its disposal vast resources of the Communications Division of American Medical Association material. Available are a wide selection of sound motion picture films, exhibits, pamphlets, sample speeches, radio and TV scripts, guides and other PR aids.

IT'S IN THE BOOK . . . THE MEDICAL DIRECTORY, THAT IS

Every year the Academy of Medicine of Cincinnati, Ohio, publishes a medical directory of Greater Cincinnati.

The book contains a roster of society members and officers, Academy of Pharmacy members, as well as a list of medical suppliers, pharmacies, laboratories, rest homes, hospitals and welfare agencies. In keeping with its purpose of supplying doctors with all the different kinds of information they might need in their daily practice, the book also contains *the society's medico-legal code; policies for advertising, speaking engagements, radio and TV appearances* and pertinent state medical statutes.

In addition, the publication includes answers to such questions as "Where can I order a hearing aid for a patient?" and "What community agency is equipped to help an indigency case?", as well as other general emergency information.

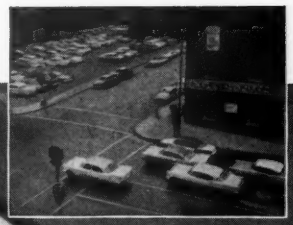
PHYSICIAN INTEREST IN EDUCATION AT HIGH SCHOOL LEVEL

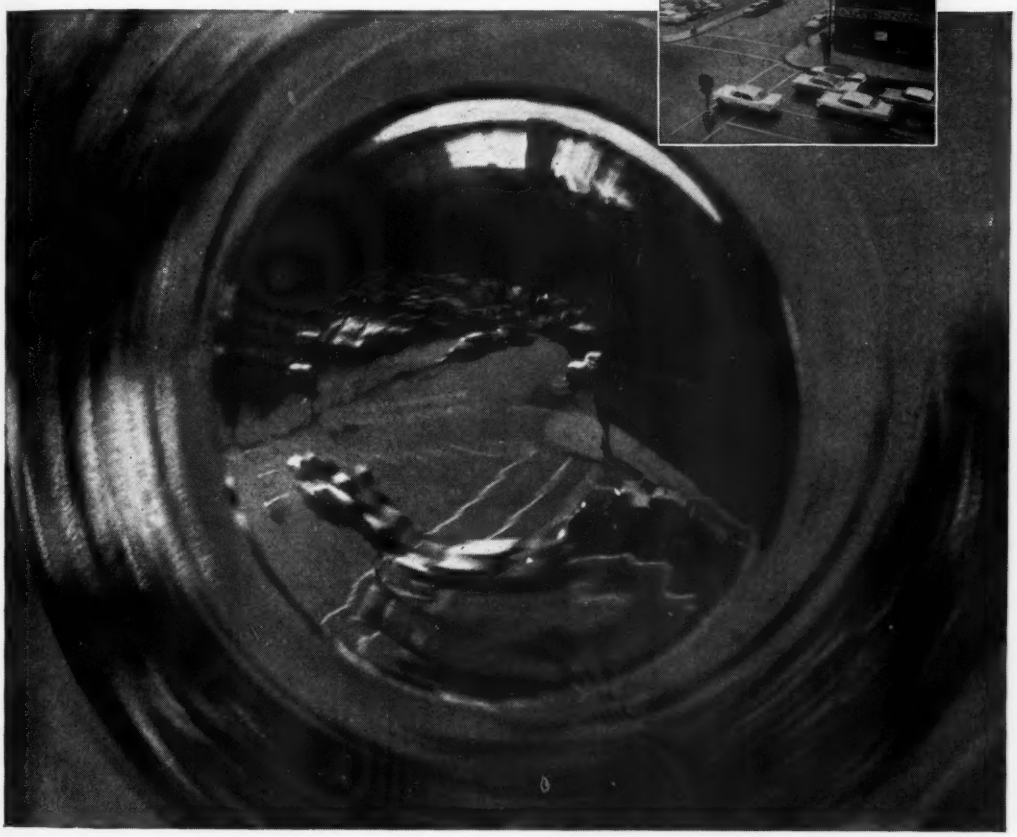
Physicians in Quincy, Illinois, through the Swanberg Medical Foundation of the Adams County Medical Society, have been putting on an educational campaign to arouse the interest of the profession in education at the high school level. They are urging county medical societies to co-operate with high school officials to grant awards to graduating students for high scholarship achievement, especially in academic subjects, to help motivate them to seek a college education. They claim if this were carried out throughout the nation, it would help America win "the cold war of classrooms" in which we are now engaged; that we are very much handicapped in the cold war because about 50 per cent of our brightest high school students do not go to college (or take the proper subjects at school).

The efforts at Quincy were initiated in 1956 (one and one-half years before Sputnik 1) by physician-members of the Kiwanis Club of Quincy and the Swanberg Kiwanis Foundation of that club, when they sponsored what is known as the Quincy Major Learning Program. This program is devoted to the guidance and motivation of the superior and talented high school students of Quincy and Adams County (Illinois) to seek a college education. The Kiwanis Foundation has just published an interesting leaflet for high school students entitled, "Are You About to Choose Your High School Courses?". This well-written, easy-to-read leaflet should do much to induce students in the upper half of their class, to pursue the proper subjects in high school to insure admission to the college of their choice. On January 19, 1959, the program (through the Kiwanis Foundation) was accorded national recognition when it received the 1958 B.V.D. Community School Improvement Award as the "most outstanding citizen-effort toward the betterment of the schools" on a community basis in the East Central Region of the United States, which comprises the states of Alabama, Illinois, Indiana, Kentucky, Michigan, Mississippi, Ohio, Tennessee and Wisconsin.

Dr. Swanberg, "sparkplug" of the educational plan, is quoted in the J.A.M.A. article: "What a wonderful achievement it would be for the nation if county medical societies all over the country would give high school academic scholarship awards. How well we succeed in education of each child to the maximum of his potential will untimately determine his fate and our own."

CONTROL VERTIGO, DIZZINESS... AND ELEVATE THE MOOD





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brand of dimenhydrinate with dextro-amphetamine sulfate

"Disturbances of balance resulting from vestibular disorders have long been known to lead to severe anxiety."*

Vertigo—whether of organic or functional origin—tends to leave depression in its wake. Dramamine-*D* is a therapeutic combination designed for treatment of the entire vertigo-reaction syndrome. Each tablet contains dimenhydrinate (50 mg.) to control dizziness, and dextro-amphetamine sulfate (5 mg.) to elevate the mood.

*Pratt, R. T. C., and McKenzie, W.: Anxiety States Following Vestibular Disorders, Lancet 2:347 (Aug. 16) 1958.

Dramamine® available as tablets, ampuls, liquid, suppositories

Research in the Service of Medicine **SEARLE**

Minnesota Blue Shield—Blue Cross

Each Blue Shield Medical Service Report form contains a space in which to enter the birth date of the patient. The form pertaining to this matter is as follows:

NAME OF PATIENT ———— PATIENT'S DATE OF BIRTH ————

Many reports are being submitted without the birth date of the patient, and whenever possible the reports are processed without obtaining this information. However, there are numerous reasons why this information is increasingly important, and should be included on every future report.

Minnesota Blue Shield, and all other Blue Shield Plans, has been requested to consider methods of providing coverage for the older persons whose numbers are constantly increasing. If Blue Shield is to give special consideration to coverage for the aged, it is first necessary to have some facts and figures on the number of persons included in the category of retired persons or senior citizens, the number of persons approaching retirement age, and the type and cost of services rendered these persons. Thus, the birth date of the patient on each Medical Service Report would enable Blue Shield to accumulate accurate data necessary for a study of such matters. Such information is also of intense interest to the medical profession and the public at this time. Equally important is that these data will be of help in future planning of all phases of Blue Shield coverage.

There are no age limits for group subscribers under Minnesota Blue Shield. Persons under sixty-five years of age who are in satisfactory health are eligible for non-group enrollment. After enrollment, coverage is never cancelled because of age. Furthermore, retirees can convert to non-group contracts with no decrease in coverage.

As of January 1, 1958, limited information at hand indicated that more than 60,000 Minnesota Blue Shield subscribers were sixty-five or more years of age. Blue Shield can logically anticipate an even greater number of participant subscribers sixty-five or more years of age in the future.

In a letter to Minnesota Blue Shield physicians, R. T. Crist, president of Minnesota Blue Cross, reported that the amendment to the Blue Cross contract excluding benefits for diagnostic care and routine physical examinations has been received enthusiastically by doctors, unions, and management.

"Hundreds of doctors have been called by phone in an effort to clarify diagnosis terminology," Mr. Crist explained. "Practically 100 per cent of these doctors have co-operated enthusiastically. Most doctors expressed a desire to help in any way possible," he continued.

Mr. Crist went on to say that from all indications, all phone calls and discussions with doctors throughout the state have begun to bear fruit, and that this would not have been possible without the complete co-operation of the doctors.

Mr. Crist concluded by promising to report further at a future date.



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with low incidence of sensitivity reactions . . .
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AMERICAN CYANAMID COMPANY, Pearl River, New York



waterloo for an ulcer...

oleon exhibited ulcer symptoms through most of adult life, yet he scorned medication for his ever-ing "spasms of nervous origin." He ignored his mities with violent naïveté despite an intense in-st in medical science. Thus, the classic hand-in- pose may have been the result of his paroxysms astric pain that sliced "like the stab of a penknife."

en your patient is besieged with an ulcer, bins provides you with an armamentarium icient to repel it.

ntal assault—If your tactics dictate Local ion, try ROBALATE,® which is dihydroxy minum aminoacetate (0.5 Gm. per tablet or), an antacid of definitely superior efficacy.

irclement — If you prefer to approach the r Systemically, prescribe NNATAL,® the anticholinergic-antispasmodic-sedative with the time-tested *natural* belladonna alkaloids and phenobarbital, a veteran campaigner without peer. FORMULA: hyoscyamine sulfate, 0.1037 mg.; atropine sulfate, 0.0194 mg.; hyoscine hydrobromide, 0.0065 mg.; and phenobarbital (¼ gr.), 16.2 mg.

multi-pronged attack — If you relish the strategy of combining antacid and antispasmodic-anticholinergic effects, use DONNALATE ® It combines one-half of a DONNATAL tablet with one ROBALATE, ideal allies for comprehensive ulcer therapy.

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Robins

SPONTIN IN SERIOUS

A Special Report from Abbott
to the Medical Profession
on a Year's Clinical Experience
with SPONTIN®
(Ristocetin, Abbott)

In a Spanish province, a patient lay dying of endocarditis. A short wave radio appeal for SPONTIN was intercepted by a Baltimore physician. The antibiotic was immediately flown to this faraway land, and 10 days later—the patient had recovered.

In Chicago, a moribund patient had been administered 18 combinations of 10 different antibiotics without success. Involved was a hospital-acquired staphylococcal pneumonia—plus complications. SPONTIN was substituted and the patient lived.

A five-week-old infant was critically ill with staphylococcal enteritis. Treatment failures included erythromycin and chloramphenicol. Three days of SPONTIN saved this life. The list is long and impressive and it grows daily.

Recently, a study[1] was made of serious and resistant staphylococcal infections reported to Abbott Laboratories. Many of these cases had serious complicating diseases—many were moribund, or almost so, at the time SPONTIN was started. Yet, out of the 160 staphylococcal cases studied, 93 were reported cured and 38 improved after the administration of SPONTIN.

Out of the total of 251 patients with severe infections caused by gram-positive or mixed organisms, 149 were reported cured and 53 others improved. And the record for pediatric practice was every bit as good.

Additionally, SPONTIN continues to exhibit exceptional bactericidal activity against coccal infections[2]. And, according to another study, SPONTIN provides successful short-term therapy in endocarditis[3].

901066

Only last October, at the Antibiotics Symposium in Washington, D. C., a panel of six leading antibiotic experts placed SPONTIN at the top of all other commercially-available antibiotics for treating serious staphylococcal infections. Also, six papers—all dealing with the effectiveness of ristocetin (SPONTIN®) in treating staphylococcal infections—were presented at the Symposium.

One of the most encouraging aspects of the year's literature on SPONTIN is the increasing testimony to its safety. As the months have passed and cases have accumulated by the hundreds, it has become apparent that careful attention to dosage recommendations has practically eliminated toxicity and side effects as serious obstacles to therapy. Also, recent improvements have been made in the manufacture of SPONTIN; the drug is now made from pure crystals.

A recent report[4] in the Journal of the American Medical Association concluded, "It is our opinion that, if proper precautions are observed, ristocetin is a [well tolerated] and potent agent to employ in the treatment of staphylococcal infections." And in another study, after successfully treating 28 patients with a variety of staphylococcal infections, the authors reported[5], "No serious complications were noted."

Few more dramatic records have been written in such a short space of time. SPONTIN has proved itself to be a good answer, perhaps the best answer at present, to the resistant staphylococcal problem—and of real value in other serious coccal infections. It may well be your answer when you're confronted with a serious infection.

Abbott

STAPHYLOCOCCAL INFECTIONS

Excerpts from Reports Read at the Antibiotics Symposium

Spontin In Treating Severe Respiratory Infections –"In 13 of 20 patients the results were excellent, with clinical response being evident within one to four days after institution of therapy. In three additional patients, there was some degree of improvement in pneumonic processes superimposed on tuberculosis in two cases and on pulmonary neoplasm in one. In all other cases, serious antecedent pathology undoubtedly influenced the negative or equivocal response to ristocetin therapy.[6]"

Spontin In Treating Staphylococcal Infections—After successfully treating 28 patients, the authors wrote, "Ristocetin or Spontin has proved to be bactericidal and bacteriostatic, particularly for the *Staphylococcus aureus*, which is often resistant to many other antibiotics.[5]"

Spontin In Treating Seven Difficult Cases – "Ristocetin has produced excellent results in eradicating, mitigating or preventing infection in seven selected difficult cases. Six of the seven cases involved *Staphylococcus aureus* which did not respond to chemotherapy with other antibiotics.[7]"

Spontin Blood Levels In Children – "Ristocetin was administered as a single intravenous injection of 12.5 milligrams per kilogram. This resulted in serum levels ranging from 1.3 to 10.6 mcg. after two hours with a gradual fall to a level of 0.7 mcg. per cubic centimeter or less after 12 hours.[8]"

Spontin In Treating Staphylococcal Pneumonia –"Ristocetin was used in the treatment of 24 patients with staphylococcal pneumonia, 17 of whom had failed to respond to previously administered antibiotics. Complete clearing of pneumonitis was obtained in 16 patients and significant improvement occurred in two others. Two patients died of pneumonia; four others succumbed to other lethal diseases.[9]"

Spontin In Treating Children and Adults – "Ristocetin completely controlled severe staphylococcal infections in 11 adults and six children who received adequate therapy.[10]"

1. Totals represent published reports and personal communications to Abbott Laboratories.
2. Sixth Annual Symposium on Antibiotics, Washington, D. C., Oct. 15, 16, 17, 1958.
3. Romansky, M. J., and Holmes, R., Successful Short-Term Therapy of Enterococcal and Staphylococcal Endocarditis with Ristocetin–Seven Patients. Preliminary Report, Antibiotics Annual, 1957-58, p. 187.
4. J. A. M. A., 167:1584, July 26, 1958.
5. Bush, L. F., et al., The Use of Ristocetin (Spontin) in Staphylococcal Infections, In Press, Antibiotics Annual, 1958-59.
6. Billow, F. J., et al., Clinical Observations on Ristocetin–A Preliminary Report on its Efficacy and Toxicity in 20 Unselected Severe Respiratory Infections, In Press, Antibiotics Annual, 1958-59.
7. Miller, J. M., et al., Ristocetin in the Treatment of Seven Selected Difficult Cases, In Press, Antibiotics Annual, 1958-59.
8. Asay, L. D., et al., Ristocetin Serum Levels in Children, In Press, Antibiotics Annual, 1958-59.
9. Schumacher, L. R., et al., Experiences with Ristocetin in Staphylococcal Pneumonia: Observations in 23 Cases, In Press, Antibiotics Annual, 1958-59.
10. Terry, R. B., Ristocetin in Children and Adults, In Press, Antibiotics Annual, 1958-59.

Public Health

REGIONAL POISON CENTERS EXTENDED IN MINNESOTA

The Minnesota Poison Information network is gradually expanding its operations for giving assistance to physicians confronted with accidental poisoning problems involving trade-named household, commercial, agricultural, and industrial products not identified of their ingredients.†

A substantial number of centers have been and are being organized on a relatively local basis, i.e., small groups of counties. Physicians requiring information should contact the Regional Center serving their county in accordance with the following schedule. Other centers serving other areas of the State will be announced in the near future.

†For detailed information, see article entitled "The Minnesota Poison Information Center Network" in the November 1958 issue, page 767.

POISON CENTERS

Hennepin, Scott, Rice, Sibley, Carver, McLeod, Wright:
- Fairview Hospital, FE 6-6691
- Minneapolis General Hospital, FE 3-1178
- North Memorial Hospital, JU 8-2753
- Northwestern Hospital, FE 2-7266

Ramsey, Dakota, Washington, Anoka, Chisago:
- Ancker Hospital, CA 2-7341
- Bethesda Hospital, CA 4-7561
- Children's Hospital, CA 7-6521
- St. John's Hospital, PR 1-5521
- St. Joseph's Hospital, CA 2-6321
- St. Luke's Hospital, CA 2-6644

Blue Earth, Freeborn, Waseca, Faribault, Martin, Watonwan, Brown, Nicollet, Le Sueur:
- Immanual Hospital—Mankato
  Mankato 8-1605

Nobles, Rock, Pipestone, Murray, Cottonwood, Jackson:
- Worthington Muncipal Hospital
  Worthington 2-5601

Ottertail, Becker, Clay, Wilkin, Grant, Douglas, Todd, Wadena:
- Lake Region Hospital—Fergus Falls
  Fergus Falls 523

St. Louis, Lake, Cook, Carlton, Pine, Aitkin:
- St. Luke's Hospital—Duluth, RA 7-6636



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Meetings and Announcements

STATE

MINNESOTA STATE MEDICAL ASSOCIATION, 106th Annual Meeting, Hotel Duluth, Duluth, Minnesota, May 25-27, 1959.

Minnesota Surgical Society, Spring Meeting, Duluth, Minnesota, July 17; Fall Meeting, Minneapolis, Minnesota, October 30, 1959.

REGIONAL

Society of Nuclear Medicine, Sixth Annual Meeting, Palmer House, Chicago, Illinois, June 18-20, 1959. Additional information obtained from Samuel N. Turiel, Administrator, The Society of Nuclear Medicine, 750 No. Michigan Avenue, Chicago 11, Illinois.

Surgery, Radiology, Pathology Symposium on Thyroid Diseases, Diagnosis and Treatment, Fifth Annual Presentation, University of Oklahoma Medical Center, May 15-16, 1959.

Biological Photographic Association, Midwestern Sectional Meeting, April 24-26, 1959, University of Iowa, Iowa City, Iowa.

Crippled Children Services Clinic Schedule, Spring, 1959: Thief River Falls, April 29-30, Trinity Lutheran Parish House; Gaylord, April 29, Gaylord City Hall; Albert Lea, May 6, Southwest Junior High; International Falls, May 6-7, Holler School So. International Falls; Fergus Falls, May 21, Armory; Morris, June 2, High School.

NATIONAL

Aero Medical Association, Thirtieth Annual Meeting, April 27-29, 1959, Statler Hilton Hotel, Los Angeles, California.

American Medical Association 108th Annual Meeting, Atlantic City, New Jersey, June 8-12, 1959.

The American College of Chest Physicians, Silver Anniversary Meeting, Ambassador Hotel, Atlantic City, June 3-7, 1959.

The American College of Physicians presents:

Postgraduate Course No. 4; Psychiatry for the Internist, June 1-5, 1959, Psychiatric Institute, University of Maryland Hospital, Baltimore, Maryland.

Postgraduate Course No. 5; Special Topics in Internal Medicine, June 15-19, 1959, Denison Auditorium, Denver, Colorado.

Postgraduate Course No. 6; Internal Medicine—Selected Topics, June 22-26, 1959, Mont Reid Pavilion, Cincinnati General Hospital, Cincinnati, Ohio.

The American College of Surgeons sectional meetings:

September

Annual Clinical Congress, Atlantic City, New Jersey, September 28-October 2. Dr. Michael L. Mason, Secretary, 40 East Erie Street, Chicago 11, Illinois.

American Heart Association, Annual Meeting and Scientific Sessions, October 23-27, 1959, Philadelphia. Scientific Sessions scheduled for October 23-25 at Trade and Convention Center. Annual Meeting of the National Assembly, Hotel Bellevue Stratford, October 26-27. Information available from Minnesota Heart Association, 1821 University Avenue, St. Paul 4, Minnesota.

New York University Post-Graduate Medical School offers: Symposium on Modern Therapeutics in Internal Medicine, Full-time, June 8-19; Clinical Gastroenterology, Full-time, June 22-26; The Management of Chronic Kidney Disease, Full-time, June 22-23; The Management of Hypertension, Full-time, June 24-25. Write Office of the Associate Dean, New York University Post-Graduate Medical School, 550 First Avenue, New York 16, New York.

Oregon Cancer Conference, sponsored jointly by the Oregon State Medical Society, the Oregon Division of the American Cancer Society, the University of Oregon Medical School and the Oregon Academy of General Practice, July 16-17, 1959, Portland, Oregon.

Pan-Pacific Surgical Association, Eighth Congress, Honolulu, Hawaii, September 28 through October 5 in 1960. Further information and brochures may be obtained by writing to Dr. F. J. Pinkerton, Director General of the Pan-Pacific Surgical Association, Suite 230, Alexander Young Building, Honolulu 13, Hawaii.

Society of Nuclear Medicine, Sixth Annual Meeting, The Palmer House Hotel, Chicago, Illinois, June 18-20, 1959.

Trudeau School of Tuberculosis and Other Pulmonary Diseases, Fourty-fourth Session, Saranac Lake, New York, June 8-26, 1959.

INTERNATIONAL

Eighth Bahamas Medical Conference, British Colonial Hotel, Nassau, Bahamas, November 27 until December 17, 1959.

Second Bahamas Surgical Conference, British Colonial Hotel, Nassau, Bahamas, December 28, 1959 until January 16, 1960.

International College of Surgeons, Twelfth Biennial International Congress, Rome, Italy, May 15-18, 1960.

(Continued on Page 470)

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Natural Prolonged Action–The action of DARICON, a more potent and better tolerated anticholinergic, is consistently prolonged because it has a unique chemical structure and is not dependent on "mechanical" means (e.g., special coating, adsorption on ion-exchange resin).

In addition to peptic ulcer, DARICON is also indicated for other gastrointestinal disorders characterized by hypersecretion, hypermotility and spasm (e.g., functional bowel syndrome, chronic nonspecific ulcerative colitis and biliary tract disease).

Dosage: 10 mg. b.i.d. (morning and evening). Supply: Tablets, 10 mg., white, scored. Bottles of 60 and 500.

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INTERNATIONAL

(Continued from Page 468)

North American Federation, Twenty-Fourth Annual Congress, International College of Surgeons, Chicago, September 13-17. For information, write The Secretariat, International College of Surgeons, 1516 Lake Shore Drive, Chicago 10.

The First International Medical Conference on Mental Retardation, July 27-31, 1959, The Eastland Hotel, Portland, Maine.

Fourth International Goiter Conference, July 5-9, 1960, London, England, under the auspices of the London Thyroid Club and the American Goiter Association. Application blanks are available from John C. McClintock, M.D., 149½ Washington Avenue, Albany 10, New York, U.S.A.

MEDICAL CONTINUATION COURSES

Medical Continuation Courses, Center for Continuation Study, University of Minnesota, to be presented:

May 11-15 Introduction to Electrocardiography for General Physicians
May 18-22 Proctology for General Physicians
May 27-29 Otolaryngology for Specialists
June 15-17 Gynecology for General Physicians

For further information concerning the above courses, write to the Director, Department of Continuation Medical Education, 1342 Mayo Memorial, University of Minnesota, Minneapolis 14, Minnesota.

PEDIATRIC SHORT COURSES

Pediatric Short Courses offered by the Children's Hospital of Philadelphia and the Graduate School of Medicine, University of Pennsylvania. Course selections include: Pediatric Advances, May 25-29, 1959; Practical Pediatric Hematology, June 1-5, 1959. Inquiries should be addressed to Irving J. Wolman, M.D., Director of Post-Graduate Education, The Children's Hospital of Philadelphia, 1740 Bainbridge Street, Philadelphia 46, Pennsylvania.

RADIATION PROTECTION MOTION PICTURE FOR PHYSICIANS

A motion picture illustrating the medical aspects of radiation, including protective measures in diagnostic radiologic examinations, will be distributed soon by the American College of Radiology to the nation's physicians.

Supervising production of the 16 mm., half-hour color film will be a special committee of the American College of Radiology under the chairmanship of Wendell G. Scott, M.D., Professor of Clinical Radiology, Washington University School of Medicine, St. Louis, Missouri.

(Continued on Page 472)

A workhorse "mycin" for common infections



respiratory infections

prompt, high blood levels

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minimal adverse reactions

With well-tolerated CYCLAMYCIN, you will find it possible to control many common infections rapidly and to do so with remarkable freedom from untoward reactions. CYCLAMYCIN is indicated in numerous bacterial invasions of the respiratory system—lobar pneumonia, bronchopneumonia, tracheitis, bronchitis, and other acute infections. It has been proved effective against a wide range of organisms, such as pneumococci, H. influenzae, streptococci, and many strains of staphylococci, including some resistant to other "mycins." Supplied as Capsules, 125 and 250 mg., vials of 36; Oral Suspension, 125 mg. per 5-cc. teaspoonful, bottles of 2 fl. oz.

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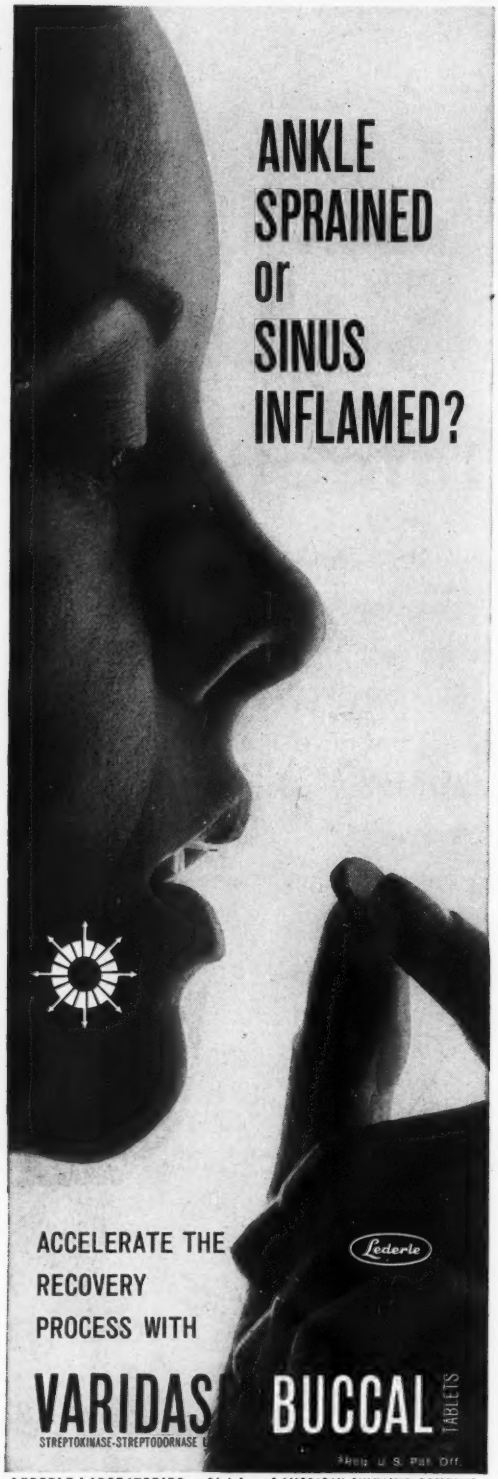
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RADIATION PROTECTION MOTION PICTURE FOR PHYSICIANS

(Continued from Page 470)

The motion picture has been financed through a Rockefeller Foundation grant and College Funds.

Premier showing of the film is June 9, 1959, at the meeting of the American Medical Association in Atlantic City, New Jersey. Following the premier, prints will be released immediately for distribution among the medical profession for showings at scientific programs, medical conventions, medical society meetings, hospital medical staff meetings and hospital association conventions.

MASSIVE BLEEDING IN DIVERTICULAR DISEASE OF THE COLON

(Continued from Page 413)

12. Brock, D. T., and King, J. V.: Massive hemorrhage from diverticulosis of the colon treated by radical subtotal colectomy. Report of a case. Mississippi Doctor, 32:254, 1955.

13. Kunath, C. A.: Massive bleeding from diverticulitis of the colon. Am. J. Surg., 91:911, 1956.

14. Scarborough, R. A.: The significance of rectal bleeding in diverticulosis and diverticulitis of the colon and rectum. Dis. Rectum, 1:49-52, 1958.

15. DeCosse, J. J., and Amendola, F. H.: The significance of bleeding in diverticulitis of the sigmoid colon. Ann. Surg., 145:540, 1957.

16. Foster, R. L., and Fisher, R. F.: Colostomy as emergency treatment for massive melena secondary to diverticulitis. Case report. Am. Surgeon, 20:734, 1954.

17. Young, J. M., and Howorth, M. D.: Massive hemorrhage in diverticulosis: Possible explanation of cause with presentation of case requiring surgical treatment. Ann. Surg., 140:128, 1954.

18. Fraenkel, G. J.: Rectal bleeding and diverticulitis. Brit. J. Surg., 41:634, 1954.

19. Hinton, J. W., and Davis, D. A.: Massive hemorrhage from gastrointestinal tract. S. Clin. North America, 29:317 (April) 1949.

20. Neal, J. W.: Diverticulitis of the colon and its surgical treatment. Surgery, 30:606, 1951.

21. Chenoweth, A.: Discussion of Noer's article. Ann. Surg., 141:684 (May) 1955.

22. Cate, Wm. R.: Colectomy in the treatment of massive melena secondary to diverticulosis; report of a case. Ann. Surg., 137:558, 1953.

23. Bartlett, M. K., and McDermott, Wm.: Surgical treatment of diverticulitis of the colon. New England J. Med., 248:497 (March 19) 1953.

24. Graham, E. A.: Editorial comment. Year Book of Surgery. P. 440. 1953-1954 series.

25. Lewis, J. E., and Hurwitz, A.: Surgical treatment of sigmoid diverticulitis. Surgery, 33:481 (April) 1953.

26. Waugh, John, and Walt, A. J.: Changing concepts in the treatment of diverticulitis of the sigmoid. Journal-Lancet, 76:373 (Dec.) 1956.



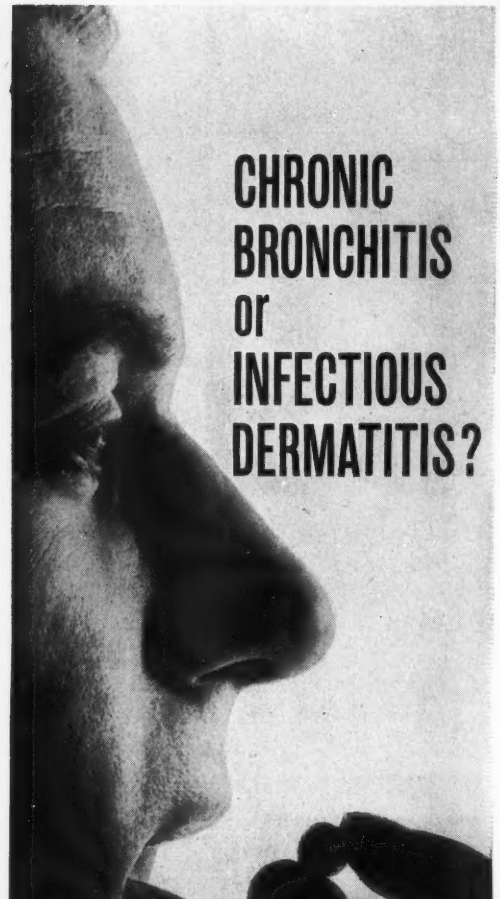
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Woman's Auxiliary

ANNUAL MEETING DRAWS NEAR

"The Physician's Wife—Generalist," will be the title of the address to be presented by Mrs. Aaron Margulis, Sante Fe, New Mexico, guest speaker at the annual luncheon of the Woman's Auxiliary to the Minnesota State Medical Association, Tuesday, May 26, at 1:00 p.m., in the Ballroom of the Hotel Duluth. Mrs. Margulis is National Committee Chairman of Mental Health of the Woman's Auxiliary to the American Medical Association.

The annual luncheon will mark one of the highlights of the 37th Annual Meeting of the Auxiliary, May 25, 26 and 27, in Duluth.

Hostesses for this year's event are members of the St. Louis County Medical Auxiliary. Auxiliary members are encouraged to take advantage of unique vacation-land setting when attending this year's annual meeting.

The General Arrangements Committee notes that Duluth's seventy-four natural parks, Skyline Parkway, Enger Memorial Observation Tower, Minnesota Point Recreational Area, and the Aerial Bridge will indeed complement the stay of auxiliary members and their physician husbands in Duluth during the annual three-day event.

Additional highlights include the following: Executive Board meeting and luncheon, Monday morning, May 25, Kitchi Gammi Club; Tea at the Tweed Art Gallery, Monday, beginning at 3:00 p.m. (this is open to all visiting women through the courtesy of the St. Louis County Medical Auxiliary, cars leave the front entrance of Hotel Duluth from 2:45 to 4:00 p.m.); Annual meeting in the Arrowhead Room of Hotel Duluth beginning promptly at 9:30 a.m., Tuesday, May 26; "Roundup Breakfast" at the Duluth Woman's Club, Wednesday, May 27, at 10:30 a.m.

A more complete summary of events will be included in the printed program. The preliminary program appears elsewhere in this issue.

PRESIDENTS' CONFERENCE

The 15th Annual Conference for Presidents and Presidents-Elect was held in Chicago at the Drake Hotel, October 6-8, 1958. Mrs. Harold H. Feslerand, Mrs. M. F. Fellows attended the meeting with me. This second year for me was like returning to a college reunion; I knew half of the women from the various states and most of the officers. It was thrilling to meet the old acquaintances and make new friends—to me a very interesting part of these conferences.

During the summer a tentative program was sent to each President asking us to sign up for one of the panels —these dealt with our various work programs. I chose Paramedical Careers. The chairman, Mrs. L. D. Jacobson, of Paramedical Careers and Recruitment Committee, wrote to me and suggested I talk on nursing and

scholarships. Instead of a speech, I prepared the information in skit form.

Each day these panels were given on the various topics; first introduced by a report from the chairman, then carried on by the volunteer presidents. Such as Monday—Legislation, Membership, Bulletin, Today's Health, AMEF, History, Finances and By-Laws. As each panel was announced, the presidents for that panel came forward, and the national chairman presided. Tuesday, there were panels on Program and Community Service, Paramedical Careers, Safety, Civil Defense, and a skit on Parliamentary Procedure. Wednesday—Mental Health was the only panel that the presidents took part in. A clinic on Auxiliary Problems moderated by Dr. Ernest Howard was given. Each national chairman sat up on the stage and we could ask them questions. Films were shown—"The Medicine Man"; "Helping Hands for Julie"; and "Preface to a Life". This type of reporting made the meeting much more interesting and very informative.

All the time was not spent in meetings. On Monday morning we were the guests of the National Auxiliary at a Continental Breakfast in the Hotel. Tuesday morning Mrs. William Mackersie, the Regional Vice President of our North-Central area, called everyone from her area to a breakfast in the Drake Coffee Shop. We all attended and enjoyed meeting our neighbors. Wednesday we ate a hurried breakfast in order to check out, so we would be ready to leave as soon as the meeting adjourned.

MRS. REUBEN F. ERICKSON,
President, State Auxiliary

HENNEPIN COUNTY AUXILIARY ANNOUNCES BENEFIT BRUNCH AND STYLE SHOW

Arrangements have been completed for the Hennepin County Medical Auxiliary's Annual Benefit Brunch and Style Show which will be held April 29-30 at 9:30 a.m. in the Dayton Sky Room.

This outstanding show is produced annually by the Dayton Oval Room, and this year an Oval Room dress and hat will be given away on each of the two days as door prizes. There will also be favors for all who attend.

Tickets at $3.00 are available by writing to Mrs. John P. Wendland, 6512 Parkwood Road, Minneapolis 24, Minnesota.

This occasion is the only fund-raising project of the year for the Hennepin County Auxiliary, and the list of philanthropic projects which benefit is long.

Mrs. Theodore Smith and Mrs. Julian Petit and their committee are in charge of arrangements.

A cordial welcome is extended to all.

THIRD DISTRICT MEETING HELD

Mrs. I. M. Hauge, Clarkfield, Regional Director of the Third District, called a meeting for the officers of the various auxiliaries in that district for the purpose of working on national reports. The luncheon meeting was held March 31 at Montevideo, Minnesota, and Mrs. Reuben Erickson and Mrs. M. F. Fellows were guests.

STEARNS-BENTON AUXILIARY SPONSORS RECRUIT TEA

The Annual Nurses' Recruitment Tea was held February 18 at the Nurses' Home of the St. Cloud Hospital. Sister Cassian and her nursing class took charge of the hospital tour, film and entertainment, and the Stearns-Benton County Medical Auxiliary served coffee, cookies, candy and nuts.

There were four boys among the 200 students served from St. Cloud and the neighboring communities. The auxiliary has changed the event to a Paramedical Career Recruitment Tea and hopes to interest more students in that way.

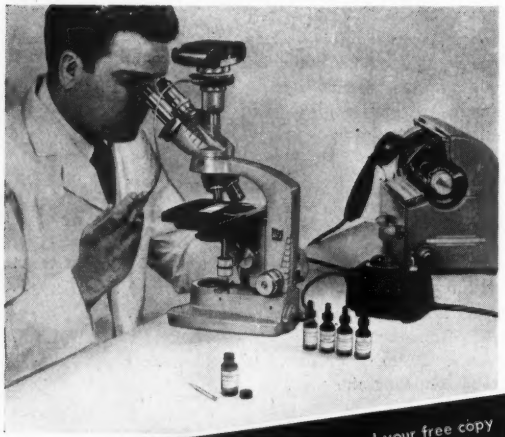
ZUMBRO VALLEY AUXILIARY SPONSORS TOUR

At its meeting March 11, the Zumbro Valley Medical Auxiliary enjoyed an educational tour of the new medical science building at Rochester. Mrs. Reuben Erickson, Minneapolis, State President, and Mrs. M. F. Fellows, Duluth, President-Elect, attended. Tea was served following the tour.



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In Memoriam

G. DOUGLAS BRAND

Dr. G. Douglas Brand, St. Paul physician, died of a heart attack February 23, 1959, in New Britain, Connecticut. He was sixty-six years of age at the time of his death.

A native of St. Paul, Dr. Brand received his preliminary education at St. Paul Central High School. He attended Northwestern University in Evanston, Illinois, and graduated from Northwestern University Medical School in 1917.

He served in the Army Medical Corps during World War I.

Positions and professional affiliations held by Dr. Brand include: Attending Staff: Ancker Hospital, St. Luke's Hospital, Miller Hospital; Chief of Varicose Vein and Ulcer Clinic, Ancker Hospital.

He is survived by his wife.

BERNARD A. FLESCHE

Dr. Bernard A. Flesche of Lake City, died February 12, 1959. He was fifty-four years old at the time of his death.

Dr. Flesche was born in Walnut Grove, Minnesota, and graduated from Albert Lea High School. His medical education was obtained in the University of Minnesota Medical School.

He was past president of the Lions Club in Lake City, chairman of the Lake City Harvest Festival, past president and secretary of the Wabasha County Medical Society, past president of the Southeastern Minnesota Medical Society, chairman of the Lake City Baseball Club. He was also a member of the Minnesota State Medical Association and the American Medical Association.

At the time of his death, Dr. Flesche was a member of the Gamehaven Council executive board and a representative to the National Boy Scout Council. He was holder of the Silver Beaver Award, which he received in 1954. He was vice president of the Gamehaven Council from 1954-55, and medical doctor of the 1950 Valley Forge National Boy Scout Jamboree.

Survivors include his wife and five children.

WILLIAM B. GRISE

Dr. William B. Grise, a practicing physician in Austin for forty-one out of the forty-four years of his medical career, died February 20, 1959. He was seventy-three years old at the time of his death.

Dr. Grise began his career as a physician in 1915 in Ada, Minnesota. The following year, he moved to Brownsdale until he went to Austin in 1918. Dr. Grise together with Drs. C. F. Lewis, Emory Rebman and C. C. Allen, also deceased, formed the Austin Clinic in 1919. Dr. Grise was past president of the Mower County Medical Society and a staff member of St. Olaf Hospital. He was a member of the Minnesota State

Medical Association and the American Medical Association.

He was graduated from high school in Louisville, Ohio, and attended Adelbert College at Cleveland. He received his Bachelor of Arts degree from Western Reserve University, Cleveland, and graduated from Western Reserve Medical School, Cleveland, in 1914. He was an intern at Miami Valley Hospital, Dayton, Ohio, 1914-15.

He is survived by his wife, a son Robert of Hopkins, and two daughters, Mrs. James Morrow (Jane), Milwaukee; and Mrs. A. Marmesh (Elizabeth), Los Altos, California.

CARL J. LUCKEMEYER

Dr. Carl J. Luckemeyer, St. Cloud physician, died March 13, 1959, at the age of forty-one. Death resulted following a heart attack which he suffered after performing surgery in the St. Cloud Hospital.

Dr. Luckemeyer was president-elect of the Hospital Staff. He also was immediate past president of the St. Cloud Exchange Club and a member of several civic organizations. A member of Stearns-Benton Medical Society, he also was a member of the Minnesota State Medical Association. His medical education was obtained from Marquette University.

Survivors include his wife and three children.



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CHARLES A. OLSON

Dr. Charles A. Olson, who had practiced medicine since 1910 on the East Side of St. Paul, died March 18, 1959. He was seventy-one years of age at the time of his death.

Dr. Olson was a native of St. Paul and received his preliminary education at Cleveland School. His medical education was obtained at the University of Minnesota Medical School.

Positions and professional affiliations held by Dr. Olson include membership of the staff of Bethesda Hospital and of the visiting staff of Children's Hospital.

He was a member of the Odd Fellows and Masonic Lodges. In addition, he was a member of the Ramsey County Medical Society, the Minnesota State Medical Association and the American Medical Association.

Survivors include his wife, Selma; two sons, Robert, rural Rosemount, and Charles L., Lake City, Minn.; a daughter, Mrs. Lee Bittner, Fort Dodge, Iowa; a brother, Elmer, St. Paul, and a sister, Mrs. Harry Nelson, White Bear Lake. There are nine grandchildren.

HARRY LEE PARKER

Dr. Harry Lee Parker, a member of the staff of the Mayo Clinic from 1925 to 1934 and from 1945 to 1959, died March 1, 1959.

Dr. Parker was born in Limerick, Ireland, and received preparatory schooling at the Marish Brothers' School in Johannesburg, South Africa. He received the degree of Bachelor of Arts in 1916 from Trinity College of the University of Dublin, and the degrees of Bachelor of Medicine, Bachelor of Surgery and Bachelor in the Art of Obstetrics from the college in 1918.

Dr. Parker volunteered for service in the Royal Army Medical Corps of England in April, 1918, and he served in France. He came to Rochester, Minnesota, in November, 1919.

He was appointed to the staff of the Mayo Clinic as a consultant in neurology on January 1, 1925, and instructor in neurology in the Mayo Foundation, Graduate School, University of Minnesota. He subsequently was advanced to Assistant Professor and Associate Professor. He left Rochester on August 1, 1934, to return to Ireland, where he practiced neurology and psychiatry in Dublin.

Dr. Parker returned to Rochester in July, 1945, as a consultant in neurology in the Mayo Clinic and Professor of Neurology in the Mayo Foundation. In 1955 he wrote a volume, "Clinical Studies in Neurology," based on lectures he had given to medical students in Dublin.

Dr. Parker received the degree of Doctor of Medicine in 1945 from Trinity College in Dublin, and in 1947 he was certified as a Specialist in Neurology by the American Board of Psychiatry and Neurology, Inc. He was a fellow of the Royal College of Physicians of Ireland and of the Royal Society of Medicine of England, and was a member of the British Medical Association, the Royal Academy of Medicine in Ireland, the Association of British Neurologists, the Minnesota State Medical Association, the American Medical Association, the Central Neuropsychiatric Association, the American Neurological Association, the Minnesota Society of



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Neurology and Psychiatry, and the Alumni Association of the Mayo Foundation.

Survivors include Mrs. Parker and two children: Sheila Margaret, curator of the Art Department of the Armed Forces Medical Library in Washington, D. C.; and Dr. Thomas Myles Parker, a fellow in pathology in the Mayo Foundation.

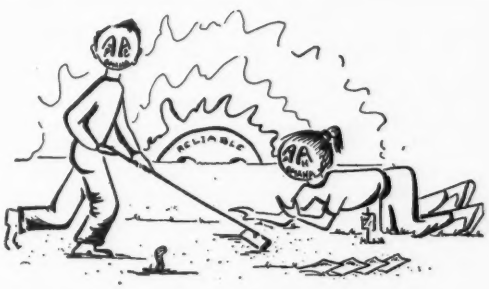
JACOB SHORT

Dr. Jacob Short, St. Paul physician, died February 18, 1959, in Miami, Florida. He had been in ill health for more than two years and was in Florida on a vacation.

A native of St. Paul, Dr. Short was graduated from the University of Minnesota Medical School in 1926. With the exception of a period of military service in World War II, he was in practice here since leaving school. He was owner of the Northwest Institute of Technology in Minneapolis at the time of his death.

He was a Scottish Rite Mason and belonged to the Ramsey County Medical Society, the Minnesota State Medical Association, the American Medical Association, B'nai B'rith, and Mount Zion Temple, and was a former vice commander of Post 162 Jewish War Veterans.

He is survived by his wife, Bess, a son, Capt. Marshall Short, stationed at Ft. Rucker, Ala.; a brother Philip, and a sister, Mrs. Isadore Bernick, both of St. Paul, and a grandson.



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The Physician's Diary

Dr. Peter J. Kitzberger, New Ulm, was elected president of the Brown County Medical Society at the annual meeting held recently in the Dacotah Hotel. Other officers are **Dr. Milton Kaiser,** vice president; and **Dr. Frank Carthey,** secretary-treasurer, both from New Ulm. New members of the society are **Dr. John Sturgis,** Lamberton; **Drs. Francis Boyle** and **John Wohlrabe,** Springfield. **Dr. Charles Tesar,** New Ulm, showed slides on common diseases of the eye and told of their treatment.

* * *

Re-election of **Dr. Reynold P. Flom,** St. Paul, as president of the Twin City Nursing Home Association, has been announced. The organization represents thirty-four nursing homes operating in the Twin City metropolitan area.

* * *

Members of the Mayo Clinic staff attended a number of meetings and institutes throughout the United States and Canada recently. **Drs. O. H. Beahrs, D. O. Ferris, E. S. Judd, J. G. Love,** and **J. M. Waugh** attended the meeting of the Central Surgical Association in Montreal, Canada. Dr. Beahrs presented a paper on "The Treatment of Carcinoma of the Tongue: End Results in 168 Cases," and Dr. Judd presented a paper written with **Drs. J. W. Johnson** and **D. C. Dahlin,** on "Malignant Neoplasms of the Colon and Rectum in Young Persons." **Drs. H. F. Ellis, J. H. Grindlay** and **W. H. ReMine** also attended the meeting. Dr. Ellis presented a paper on "Open Heart Surgery in the Treatment of Acquired Mitral Insufficiency," and Dr. ReMine discussed a paper presented at the meeting. **Dr. G. B. Logan** attended a meeting of the American Academy of Allergy held in Chicago. He also assisted with examinations of the Subboard of Allergy of the American Board of Pediatrics and attended a meeting of the Advisory Council of Allergy. Recently, he took part in a postgraduate course at the University of Texas, Galveston, presenting papers on "Liver Disease in Infancy," "Diagnosis, Pathology and Treatment of Childhood Asthma" and "Use of Steroids in Allergic Diseases in Children." **Dr. G. A. Peters** also attended the meeting of the American Academy of Allergy. A paper, titled "The Treatment of Interatrial Communications," was presented by **Dr. J. W. Kirklin** as part of a course on "Recent Advances in Cardiovascular Disease." The course was held under the auspices of the American College of Physicians and Mount Sinai Hospital, in New York. **Dr. N. G. G. Hepper** attended a meeting of the Minnesota Trudeau Society in St. Paul. He is secretary-treasurer of the organization. Also attending were **Drs. M. B. Divertie** and **H. W. Schmidt.**

* * *

The humor and pathos that flavors the practice of medicine were recalled by **Dr. R. H. Wilson,** Winona, whose practice has spanned thirty-six years, in an address at a recent luncheon meeting of the Winona Kiwanis Club at Hotel Winona. "A doctor," Dr. Wilson observed, "is the first one you see when you come into this world and the last you see when you go out. Between these extremes lie all of the tragedies and comedy of life." A former president of the Minnesota State Medical Association, the son of a doctor and himself a father of a physician, Dr. Wilson reminisced on the "Golden Age of Medicine" and noted the advances in medical techniques and procedures that have been realized in the years since he, as a boy, observed his father in his practice.

* * *

At a meeting of the Kanabec County Hospital Staff recently, **Dr. H. L. Berge,** Mora, was named Chief of Staff by fellow medical staff members. Chosen as Assistant Chief of Staff was **Dr. C. S. Bossert.** Clifford Johnson, Hospital Administrator, was named as secretary-treasurer of the organization. Other staff members are **Drs. Willard Nordman, Edward Burseth, A. C. Peterson and G. S. Lewallen.**

* * *

An annual lectureship in child health and welfare has been provided for by a bequest in the will of the late **Dr. H. F. Helmholz,** it has been announced. It is to be known as the Amberg-Helmholz lectureship and will commemorate the forty-six years that Dr. Helmholz and his colleague, **Dr. Samuel Amberg** worked together in the field of pediatrics. The bequest is for $10,000 and is made to Mayo Association.

* * *

Dr. Wayne C. Rydburg has been elected president of the medical staff at Swedish Hospital, succeeding **J. Harold Schultz, M.D.** Both are from Minneapolis. Other officers include **Dr. Earl C. Hindrikson,** president-elect, and Robert E. Kasper, secretary-treasurer.

* * *

Dr. J. L. Bader, Slayton, was named by the membership to represent the Slayton Toastmasters Club at the area contest to be held in the near future. As Slayton winner, he will compete with winners from Toastmasters organizations from a number of southwestern Minnesota communities.

* * *

Eight Mayo Clinic staff members appeared on programs during the four-day sectional meeting of the American College of Surgeons in St. Louis, recently. The Rochester physicians and their subjects were as follows: **Dr. O. T. Clagett,** "Carcinoma of the Lung"; **Dr. Malcolm B. Dockerty,** panel, "Uses, Problems and Abuses of Frozen Section Diagnosis"; **Dr. F. Henry Ellis, Jr.,** "Use of Extra-corporeal Calculation in the Surgery of Congenital Heart Disease" and panel, "Surgery of Heart Disease"; **Dr. Joseph M. Janes,** "Amputations in Peripheral Vascular Disease"; **Dr. Paul R. Lipscomb,** "Orthopedic Aspects of the Protruded Intervertebral Disc Syndrome"; **Dr. William H. ReMine**

and **Dr. Waltman Walters,** cine clinic, "Cancer of the Stomach, Gastrectomy."

* * *

Official announcement was made recently by **Dr. C. M. Robilliard,** Faribault, of his retirement as a practicing physician. He is now convalescing at his home in Faribault.

* * *

The medical staff at the Rice Memorial Hospital in Willmar, honored **Dr. J. C. Jacobs,** a retired colleague, at a dinner meeting recently. At the testimonial dinner, held at the the Fireside, the honored guest, now retired after more than fifty years of service to this community, was presented with a traveling bag, as a token of esteem and recognition. The presentation of the gift was made by **Dr. R. K. Proeschel,** on behalf of the assembled fellow physicians and surgeons.

* * *

Drs. E. V. Allen and **Thomas H. Seldon,** Mayo Clinic staff members, were members of a faculty of thirty-three speakers from twenty-two medical schools of the United States who presented papers at the annual clinical conference of the Chicago Medical Society in the Palmer House, Chicago, recently. Nearly 4,000 physicians from the midwest and Canada attended. Dr. Allen's subject was "Natural History of Arteriosclerosis Obliterans," while Dr. Seldon spoke on the topic, "Problem in the Usage of Blood and Fluids in Surgery." Dr. Allen is senior consultant in medicine of the Mayo Clinic and professor of medicine in the Mayo Foundation. Dr. Seldon is consultant in anesthesiology, Mayo Clinic, and associate professor of anesthesiology, Mayo Foundation.

* * *

Dr. Charles W. Alden, Kimball, has moved to new office quarters in the Dingmann Building. The building has been remodeled and made into a modern office with examining rooms, x-ray rooms and all modern facilities.

* * *

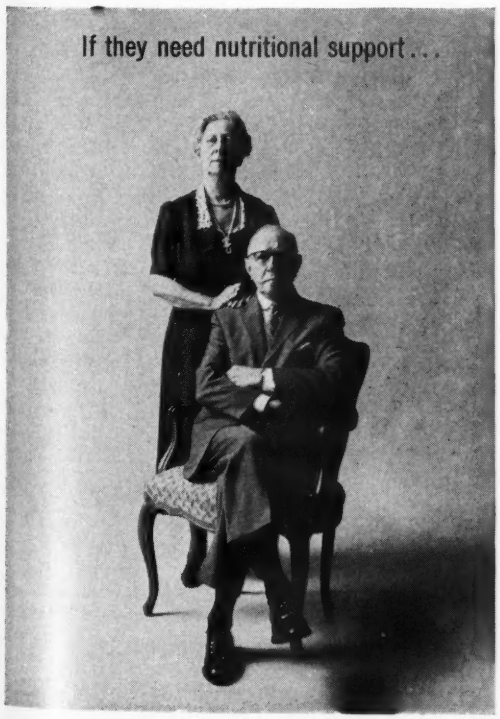
Dr. H. T. Petraborg was elected president of Aitkin Community Hospital at the annual reorganizational meeting recently. **Dr. Richard Burman** and **Dr. F. C. Closuit,** both of Aitkin, were elected vice president and secretary-treasurer, respectively.

* * *

Dr. Harold O. Perry and **Dr. Stanley A. Lovestedt** of the Mayo Clinic received the first award for their exhibit, "Lesions of the Oral Mucosa," presented at the 24th annual midwinter clinical session of the Colorado Medical Society held in Denver, recently. Dr. Perry is a consultant in dermatology, Mayo Clinic, and instructor in dermatology, Mayo Foundation. Dr. Lovestedt is head of the section of dentistry, Mayo Clinic, and assistant professor of dentistry, Mayo Foundation.

* * *

Dr. Hildegarde J. Virnig, Caledonia, has been named Houston County Civil Defense Medical Director according to Claude Kremer, County CD Chairman.



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Dr. A. O. Swenson, Duluth, was named chief-elect of St. Mary's Hospital at the annual dinner meeting of the medical staff of the hospital. **Dr. S. S. Houkom** was installed as chief, succeeding **Dr. J. K. Butler,** Cloquet, who presided at the meeting. About 130 physicians attended the meeting addressed by **Dr. R. W. Gifford,** Rochester, consulting physician at the Mayo Clinic. Other members of the hospital medical staff named to the executive committee as departments chiefs are **Drs. O. G. McDonald,** surgery; **N. E. A. Leppo,** pediatrics; **C. M. Jessico,** psychiatry; **F. T. Becker,** dermatology; and **G. C. MacRae,** chronic illness. Completing their terms of office as department chiefs are **Drs. F. W. Conley,** medicine; **B. F. P. Williams,** obstetrics; **W. A. Swedberg,** orthopedics; **C. D. Eklund,** general practice; **K. E. Latterell,** anesthesiology; **A. C. Aufderheide,** pathology and **J. R. McNutt,** radiology. **Dr. J. B. Moyer** was named secretary of the executive committee.

* * *

Talks on rehabilitating cardiac patients were given by **Dr. John F. Briggs,** associate professor of clinical medicine at the University of Minnesota; **Dr. Milton Hurwitz** and **Dr. William Lick,** state consultant for vocational rehabilitation, both of St. Paul, at the Sixth Annual Advanced Safety Engineering Institute recently at the University of Minnesota's Continuation Study Center.

* * *

"Experiences of an American Doctor in a Village Hospital in India" was the title of the address given by **Dr. Warner Ogden,** St. Paul, at a recent meeting of the Women's City Club of St. Paul.

* * *

Dr. Arnold J. Kremen, Minneapolis, has been appointed to the Cancer Committee of the American College of Surgeons to represent this area.

* * *

Minnesotans attending a two-day conference on the medical problems involved in treating patients with arthritis and birth defects (congenital malformation) recently included **Dr. G. M. Martin,** consultant in the Section of Physical Medicine and Rehabilitation of the Mayo Clinic; **Dr. M. E. Mosby,** Long Prairie; **Dr. James W. Duncan,** Moorhead; and **Dr. W. S. Neff,** Virginia. More than one hundred physicians from fourteen midwestern states attended the Chicago meeting.

* * *

Dr. Robert Vaaler, Cokato, who has been associated with **Dr. W. Theodore Greenfield** in medical practice in Cokato since July, 1956, recently discontinued his practice there. Dr. Vaaler has now started residency training at the University Hospitals, Minneapolis, in anesthesiology, with the objective of specializing in this field. His period of training will be two or three years.

* * *

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Dr. F. J. McCaffrey, Dr. Robert Daniel Semsch, Dr. George O. Hilgermann, and **Dr. Deane Alfred Petersen.**

* * *

Dr. Gordon R. Kamman, St. Paul, attended the regional medical-legal convention held by the American Medical Association and the American Bar Association on March 20 and 21 in Washington, D. C. About 450 physicians and attorneys were present.

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At the annual meeting of The American College of Physicians held in Chicago on April 23, 1959, **Dr. Wesley W. Spink,** Professor of Medicine at the University of Minnesota Medical School, was elected First Vice President of the College for 1959-1960. He was also elected to the Board of Regents. Dr. Spink has been a member of the Board of Governors of the College during the past nine years, representing Minnesota. President-elect of the College is Dr. Chester S. Keefer of Boston.

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Dr. John Briggs, St. Paul, spoke to volunteer tuberculosis workers recently when he was the principal speaker at a luncheon in state Christmas Seal headquarters. The meeting was for the purpose of discussing new ways of promoting the sale of Christmas Seals.

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Dr. George T. Aitken, director of the Area Child Amputee Center, Grand Rapids, Michigan, gave a lecture on "The Clinical Management of the Juvenile Amputee" at the Mayo Clinic, Rochester, Minnesota, on March 26, 1959.

Dr. Giles A. Koelsche, consultant in medicine in the Mayo Clinic, Rochester, Minnesota, and assistant professor of medicine in the Mayo Foundation, Graduate School, University of Minnesota, was named president-elect of the American College of Allergists at the fifteenth annual meeting of the organization on March 18 at San Francisco, California.

* * *

Dr. Richard A. DeWall, and **Dr. Alan P. Thal,** University of Minnesota, were among ten medical scientists who were awarded fellowships totalling $114,000 for heart and blood vessel disease studies, the Minnesota Heart Association announced recently. The awards represent the first part of the 1959-60 national research program sponsored by the American Heart Association and affiliated state Associations.

* * *

Dr. Winchell McK. Craig, emeritus head of the Section of Neurologic Surgery of the Mayo Clinic and emeritus professor of neurologic surgery in the Mayo Foundation, Graduate School, University of Minnesota, spoke on the occasion of the presentation of a portrait of the late Dr. Gilbert Christian Anderson to the Louisiana State University School of Medicine in New Orleans on April 1. Dr. Anderson died on June 20, 1948.

Dr. Anderson, a native of Tennessee, came to Rochester on April 1, 1924, as the first fellow of the Mayo Foundation to specialize in neurologic surgery and the first to receive from the University of Minnesota, by way of the Mayo Foundation, the degree of master of

science in surgery with a special emphasis on neurologic surgery. This degree was awarded to him in 1927.

Dr. Anderson left Rochester on July 1, 1927, and entered into the private practice of neurologic surgery in New Orleans. He was one of the founders of the American Board of Neurological Surgery, Inc., and was a charter member of the Harvey Cushing Society. He was a member of the staffs of the Touro Infirmary, the Eye, Ear, Nose and Throat Hospital, the Charity Hospital, the Southern Baptist Hospital, the Hotel Dieu Hospital and the French Hospital, all of New Orleans, and he was assistant professor of surgery in the Louisiana State University Medical Center in that city.

* * *

Ten Minnesota medical scientists have been awarded Heart Fund research fellowships totalling $114,000 for heart and blood vessel disease studies during the year beginning July 1, 1959.

Dr. Karl W. Anderson, president of the Minnesota Heart Association, identified the recipients as: Drs. Richard A. DeWall, Anastasius Dontas, Victor Lorber, Edward Ronwin, Alan P. Thal, Naip Tuna, Robert L. Vernier, Lewis W. Wannamaker, and Warren J. Warwick, all of the University of Minnesota, and Dr. James J. Peifer, Hormel Institute, Austin, Minnesota.

The $114,000 national grant was Minnesota's share of $1,562,243 given on March 25 to 182 scientists in twenty-eight states and two foreign countries by the American Heart Association.

The awards represent the first part of the 1959-60 national research support program sponsored jointly by AHA and affiliated Heart Associations.

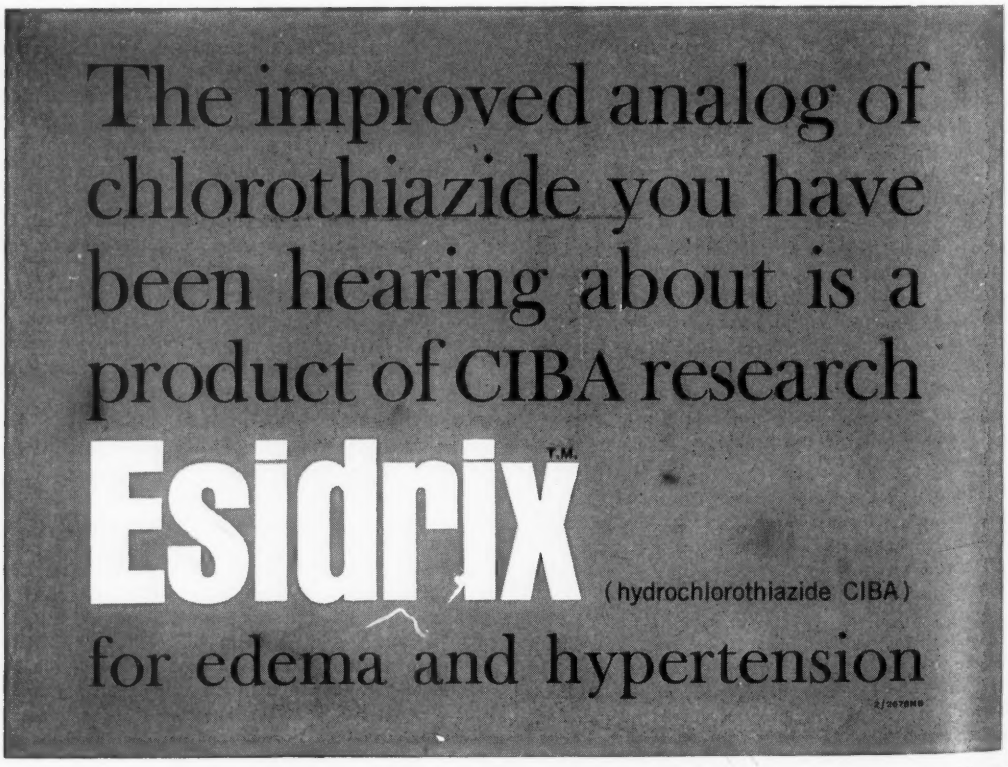
National research grants returned to Minnesota scientists, said Dr. Anderson, have consistently exceeded the amount of Heart Fund dollars sent to national headquarters from this state, because of the outstanding research facilities and people existing in Minnesota.

VARICOSE VEINS DURING PREGNANCY

(Continued from Page 410)

References

1. Burwell, C. S.: A comparison of the pressures in arm veins and femoral veins with special reference to changes during pregnancy. Ann. Int. Med., 11 (pt. 2):1305-1310 (Feb.) 1938.
2. McLennan, C. E.: Antecubital and femoral venous pressure in normal and toxemic pregnancy. Am. J. Obst. & Gynec., 45:568-591 (Apr.) 1943.
3. Veal, J. R., and Hussey, H. H.: The venous circulation in the lower extremity during pregnancy. Surg., Gynec. & Obst., 72:841-847 (May) 1941.
4. Wright, H. P., Osborn, S. B., and Edmonds, D. G.: Changes in the rate of flow of venous blood in the leg during pregnancy, measured with radioactive sodium. Surg., Gynec. & Obst., 90:481-485 (Apr.) 1950.
5. Myers, T. T.: Results and technique of stripping operation for varicose veins. J.A.M.A., 163:87-92 (Jan. 12) 1957.
6. Lofgren, K. A., Ribisi, A. P., and Myers, T. T.: An evaluation of stripping versus ligation for varicose veins. A.M.A. Arch Surg., 76:310-316 (Feb.) 1958.



The Management of Emotional Stress in the Housewife

● **Consider the housewife in her house: she toils, she weeps, and she has pain. This paper emphasizes the importance of stress as a cause of symptoms in housewives. The author points out the value of early recognition by the family physician of these psychiatric implications. Psychiatric first aid by the family physician often can obviate later, more complicated psychotherapy.**

ROBERT L. FAUCETT, M.D.
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THE COVERAGE of this title is so broad, in respect to the condition mentioned and also to the group of patients suffering from the condition, that some clarification is needed. First, a definition of the patient: The term *housewife* shall be used to represent the worker in that most difficult of all occupations which is really a multiplicity of occupations, including companion, mother, sexual partner, cook, homemaker, hostess, chauffeur, financier, citizen, teacher, and often auxiliary breadwinner. The difficulty of this multiplicity

Read at the Clinical Session of the American Medical Association, Minneapolis, Minnesota, December 2 to 5, 1958.

From the Section of Psychiatry, Mayo Clinic and Mayo Foundation, Rochester, Minnesota. The Mayo Foundation is a part of the Graduate School of the University of Minnesota.

of roles is accentuated by the fact that the occupation of housewife is not held in high esteem, or at best does not provide prestige in our culture commensurate with its arduousness and value. This, when added to the fact that many women have been carefully taught in childhood that womanhood is a state to be abhorred, makes it a minor miracle that not all housewives exhibit overt symptoms of emotional stress.

But to describe a pathologic condition in terms of a total population is impractical. Emotional stress will be considered here as those combinations of overtaxing of capacity, insufficient gratification, and inability to accept the feminine role which lead to the development of symptoms which bring the victim to consult a physician. This situation is likely to be chronic or subacute. The symptoms may be exclusively somatic; or whatever their type, they may not be recognized or accepted by the patient as related to the interpersonal or environmental stresses of living; and they may not be incapacitating enough to cause hospitalization if psychiatric referral is not necessary or available.

Dealing With the Housewife's Stress in General

The fundamentals of managing these reactions are essentially the same as in other aspects of medicine, namely the eliciting of the history, the detection of the events in the history which have relevance to the emotional disturbance, the sharing with the patient of the reasons for the conclusions drawn, and the presentation of alternatives for the amelioration of the problem.

Difficulties.—There are two problems which tend to make this procedure more difficult. From the start, most physicians have been trained to study breakdowns or disorders of the human as aberrations of a physicochemical machine rather than as responses of a psychosocial organism. Many physicians thus hesitate and even refuse to venture into fields where they do not feel competent, although psychosocial data are not mysterious and often lend themselves to commonsense logic once enough facts have been collected and interpreted. (Sometimes, however, attempts are made to manage without this step.)

The second difficulty is shared by physician and patient. In the case of physicochemical breakdown the primary therapeutic effort is in the activity of the physician, and the patient's responsibility is less. In the case of psychosocial breakdown the emphasis is reversed and the patient must accept responsibility for making changes in her life situation to restore equilibrium. Patients naturally are reluctant to undertake the burden of the cure, and many physicians are reluctant to part with their prerogatives as magical medicine men.

Positive Principles.—Obviously a thorough discussion of technique is impossible here, but several principles and pitfalls in the management of this situation can be mentioned.

Medical Study.—Even if the symptoms seem clearly emotional, a careful medical history and examination with indicated laboratory work are indispensable. It is surprising how many organic illnesses in the early phases elicit symptoms of anxiety, fatigue, depression, and somatic concern which may sound hypochondriacal. This is especially true of diseases of organs of internal secretion before localizing symptoms have developed, for the patient has a vague but distressing feeling that something is wrong and because of the vagueness describes it in bizarre terms.

Report of Cases

Case 1.—A married woman, aged forty-two, came complaining of lethargy, fatigue, insomnia, anorexia, constipation, amenorrhea, and inability to concentrate. She had been referred for electroshock treatment after a medical consultation at home. She described episodes of forgetfulness of recent events in a peculiarly humorous fashion and described herself as "comical." No self-depreciation or feeling of guilt was elicited, however. Medical and laboratory examinations revealed myxedema with a basal metabolic rate of —39 per cent and a value of 1.0 microgram of protein-bound iodine per 100 ml. of blood. She was treated with thyroid extract, and the symptoms of myxedema disappeared. Her psychiatric symptoms remained only slightly improved; but since such symptoms are often the last to disappear in myxedema, a period of watchful waiting was decided upon.

The patient was seen eight months later and was judged to be euthyroid. The basal metabolic rate was —3 per cent, and the value for protein-bound iodine was 4.6 micrograms. She still complained of anorexia, lack of interest in home or family, and crying spells; and, although she was less forgetful, she still had trouble thinking and calculating. The psychiatrist was

impressed again by the lack of guilty self-depreciation; as the patient expressed it, "I worry because I do not worry about my situation enough." She had expressed anxiety about going down stairs and admitted to have fallen once. She had awakened on several occasions with uncontrollable swallowing movements. She insisted that there was something organically wrong with her and that her difficulties were not on a functional basis. Psychologic testing showed organic confusion. An electroencephalogram disclosed a dysrhythmia, grade 2, localized in the right parieto-occipital region. Pneumoencephalography revealed a communicating porencephalous cyst in this region. No surgical treatment was recommended.

Although nothing could be done to alleviate her symptoms, the patient was glad to have had her own diagnosis confirmed and to be absolved of "neurotic complaining." Modification of environmental responsibilities left her functioning well at a level within her capabilities.

Opening of Psychosocial Inquiry.—After medical examination has failed to produce a diagnosis, the physician may suggest that the presenting symptoms could be due to environmental stress, and offer opportunity to discuss it. Such inquiry should be preceded by reassurances that this does not mean the patient is crazy or weak or blameworthy. Some resistance may be met, in which case the patient must be allowed to decide whether she wishes to explore this aspect of the situation. Cajoling, scolding, and insistence have no place here. No patient can provide data relevant to any kind of illness without wholehearted co-operation and wish to get well. It must be remembered that frequently patients visit a physician not to be healed but to get some secret and often subconscious gratification out of frustrating him.

Physician's Interest.—The patient must be made to feel that the physician is as interested in hearing this material as he was in hearing the description of the somatic symptoms. Any physician who cannot muster interest in this aspect of illness cannot manage the situation adequately and should consider referral to a colleague who can.

Interviewing Others Involved.—The advantage of interviewing other persons involved in the situation should always be considered. Frequently this will open avenues of communication previously not utilized by the patient in the sharing of her burdens.

Interpretation of Data.—Some attempt at summing up the data must be made. Emphasis must be placed continually on the environmental problems to be solved; and use of phrases like "it's your nerves," "chronic nervous exhaustion," and so on should be avoided. These phrases refer to the physicochemical machine and encourage the patient to continue focusing on her organic system.

Presentation of Alternatives.—It must never be forgotten that the physician's function should be to delineate the problem and if possible present the patient with alternatives. One of the alternatives must always be that the patient can continue as before. Usually it is the physician's role to help the patient help herself rather than to attempt to solve the problem for her.

Case 2.—A forty-five-year-old woman came to the clinic complaining of pain in the rectum of twenty-five years' duration. For the three years prior to her registration this pain had become so severe as to be incapacitating. Roentgenologic and proctoscopic examinations gave no explanation. The internist called the psychiatrist and said that unfortunately he knew less about the patient than he did about her rectum, but that she had mentioned that her husband was cruel and inconsiderate. The psychiatrist began the interview by saying, "I understand your husband is something of a pain to you."

The patient, whose plans required her to return to her distant home the next day, inquired how long the interview would last. On being told that the psychiatrist had twenty minutes at her disposal, she told the following story.

Her mother had died at the patient's birth, and the patient had been reared by an aunt who inculcated a feeling of guilt for the mother's death by innumerable references to the gratitude the patient should feel for the aunt's "generosity." The aunt exploited the guilt by almost making a slave of the girl. At the age of sixteen years, during an absence of the aunt and uncle, the patient was seduced, with the help of wine, by an uncouth and untutored hired hand, causing her considerable pain and increasing her sense of guilt. When she told the aunt about it in a tearful plea for sympathy, the aunt insisted that the only course was marriage—obviously to get rid of her. The girl acquiesced, and she had continued in this marriage for twenty-nine years with rage bound by guilt. She had tolerated it only because of guilt and masochistic needs.

At the end of the recital the patient said she could see the relationship of her rectal pain to her life history, and she asked what she should do. The psychiatrist offered three courses: (1) to continue as before, (2) to leave the husband, or (3) to express

feelings directly and openly instead of in physical symptoms. She begged him to choose, but he demurred. In a letter received several months later the patient wrote, "My pain is gone; I didn't leave him, but he doesn't like it." This result was achieved by devoting twenty minutes to the patient's life situation.

Offer of Continued Help.—The physician may indicate continuing interest and willingness to see the patient regularly, even for brief periods, provided he makes it understood that the time is to be used purposefully for further clarifying the patient's life situation.

Pitfalls.—There are some corollary pitfalls to be avoided.

Hasty conclusions that the trouble is emotional in nature. Even if this is the case, the patient's confidence and rapport are increased by a careful attention to the medical examination.

Anxiety and impatience in the physician. If these feelings are present, the physician's awareness that he has them should help him avoid the prescription of sedatives, vitamins, unnecessary laboratory examination, and so on merely as a way of lessening his own discomfort.

Overidentification with the patient or acceptance of her rationalizations. The description of the situation may be distorted by the patient's need to project the difficulty elsewhere so she may avoid facing her responsibilities in it. This is frequently the case where the personality and behavior of the husband are alleged to be the source of the stress. It may be so, but such statements cannot be taken at face value without giving the husband equal time.

Giving advice categorically rather than offering tentative suggestions. Advised categorically, the patient has to accept the advice or break off the relationship with the physician. Tentative suggestions avoid this dilemma, and can open more areas of information by the discussion they stimulate.

Practicing magic—the use of placebos, suggestion, or such nonsense as "why don't you just relax," "stop worrying," and the like. If the patient could do this she would not have visited the physician in the first place.

Comment.—If the request of the patient for help is evaded—or if any other course than facing the facts and eliciting the data about social history and circumstances is followed—many untoward consequences can ensue. If the patient's difficulties are ignored or an attempt is made to manage by physicochemical methods or without collection of psychosocial data and use of psychosocial methods, an impasse arises.

The application of knowledge derived from study of the person as a physicochemical machine is not successful in solving problems of interpersonal relationships. Yet the expectation of magical solutions to psychosocial problems by application of physicochemical methods is increased and perpetuated in the patient population. I suspect that this exaggerated expectation accounts for a large degree of the increasing dissatisfaction with and derogation of the medical profession as a whole in the face of marvelous advances in technical knowledge and skill in relieving physicochemical breakdowns such as have been reported at this meeting.

The physician's acceptance of the total responsibility to "make the patient well" by suggestion, surgery, or sleeping pills does not educate her or point out to her the source of her difficulties. Conversely, it does prevent her from accepting some responsibility for her distress and its relief. As long as her attention is focused on her organic system as the seat of the difficulty, she can do nothing to help herself against the menace in the psychosocial realm.

Furthermore, she may suffer from secondary complications of the attempt to cure her by repair of the machine or by giving medicaments. Her confidence in physicians, and their respect for her, may suffer so that when a structual illness supervenes she is denied the full benefits of modern medical skill by her unwillingness to see a physician or by his preconceived notions of the nature of her trouble.

The complication of financial stress also may increase her troubles.

Management of Acute Stress

Another type of stress I should like to discuss briefly is the acute type brought about by loss or the threat of loss—whether personal, as in bereavement, or material—or by sudden disabling illness, or by any form of necessity for changes in the place or mode of living. In his studies of psychologic reactions to civilian disasters, Tyhurst[1] has referred to these as "transition" states.

For several reasons, it is important to have an understanding of the nature and handling of these transition states.

First, the way in which reaction to catastrophe is handled determines to a large extent whether this event will be a constructive bridge to a satisfactory adjustment to a changed way of life in the future or will be borne as a cross, with a martyred, resentful attitude and all its regressive and destructive features that bind the victim to the past so firmly that future growth is impossible. In addition, this method of dealing with catastrophe may be thus transmitted to the children in the family, and their growth likewise hampered by it.

Second, physicians frequently are in a position to administer psychiatric first aid in situations involving death or severe illness of spouse, parent, or child, and to perform a valuable function in preventive psychiatry and avoidance of emotional illness in the future. The physician in this role appears to me to be the most profitable agency now available to preventive psychiatry.

Because the psychologic dynamics and principles of management are essentially the same for all acute disruptions of emotional relationships and modes of living, the situation caused by the death of a husband may serve as a prototype.

What is to be discussed here has been derived from wartime experiences, from Tyhurst's[1] study of reaction to civilian disaster, and from psychiatric experiences in working with unhealthy reactions to catastrophe.

Reactions to such a catastrophe can be divided into three parts:

The Period of Impact.—This is the period when the impact of initial stress exists, when the imminence or occurrence of death is recognized, and when all the details of dealing with it preoccupy the victim's mind. About 12 to 25 per cent of persons in this situation react with coolness and collected behavior; about 70 per cent are stunned and bewildered; and about 10 to 25 per cent show manifestly inappropriate responses—states of confusion, paralyzing anxiety, inability to move out of bed, hysterical crying and screaming, or outbursts of angry vituperation even toward the dead person. Usually this period is brief, a matter of a few hours. The reactions within it are not crucial to future adjustment. Sedatives may be indicated, but intervention is not.

The Period of Recoil.—There follows a gradual return of self-consciousness and awareness of the immediate past as well as of the nature of the emotional relationship that has been disrupted. This is the crucial phase in the grief reaction, and future emotional health depends on its being properly worked through. For the majority of people the first overt emotional expression occurs in this phase. There is a great need to talk and ventilate feelings about the one who is dead. This need to ventilate—to cry, to be angry, to talk about the past—must be encouraged. The bereaved one needs to recall the unpleasant as well as pleasant aspects of the relationship. This emotional ventilation is necessary in order for the victim to begin to relinquish the emotional investment and to free energy for future constructive emotional relationships. For reasons that cannot be included here our society has discouraged this ventilation. The bereaved one who is "brave," keeps a "stiff upper lip," "holds up well" is praised. Mothers refuse to grieve "for the sake of the children," who also need to grieve and need her acceptance of this expression.

Accompanying this need to ventilate is a childlike dependence, a need to be taken care of. More important than the tokens of being taken care of is the psychologic significance of being cared for.

Religious rituals such as wakes and other emotion-charged rites serve these purposes well, but now are indulged in by a minority of the population. A physician, however, with his aura of authority and tradition of caretaking, can be a very significant figure in encouraging an appropriate expression of the grief reaction rather than participating in its suppression for reasons of social approbation.

Lindemann[2] has provided an accurate description of persons in this state.

> Common to all is the following syndrome: sensations of somatic distress occurring in waves lasting from twenty minutes to an hour at a time, a feeling of tightness in the throat, choking with shortness of breath, need for sighing, and an empty feeling in the abdomen, lack of muscular power, and an intense subjective distress described as tension or mental pain. . . .
>
> The sensorium is generally somewhat altered. There is commonly a slight sense of unreality, a feeling of

increased emotional distance from other people (sometimes they appear shadowy or small), and there is intense preoccupation with the image of the deceased. . . .

Another strong preoccupation is with feelings of guilt.

In addition, there is often disconcerting loss of warmth in relationship to other people, a tendency to respond with irritability and anger, a wish not to be bothered by others at a time when friends and relatives make a special effort to keep up friendly relationships. . . .

The activity throughout the day of the severely bereaved person shows remarkable change. . . . There is restlessness, inability to sit still, moving about in an aimless fashion, continually searching for something to do. . . .

These five points—(1) somatic distress, (2) preoccupation with the image of the deceased, (3) guilt, (4) hostile reaction, and (5) loss of patterns of conduct—seem to be pathognomonic for grief.

These symptoms and signs of disturbed psychologic functioning must be regarded as normal for a person in the situation assumed, and their absence may be an ominous sign for that person's future health. Our tendency to regard symptoms invariably as signs of illness requiring elimination needs to be revised in this instance. We should think of the transition state as setting the stage for an opportunity for growth.

It is in this stage of recoil that intervention by the physician is indicated. The nature of the intervention is too detailed for presentation here, but a few principles can be mentioned.

1. The patient should not be removed from her situation—geographically, socially, or emotionally. Sedatives and tranquilizers should be used sparingly, and only in situations where the turmoil is intolerable.

2. The physician must accept disordered affect, irrational attitudes, and negative responses in a nonjudicial way and encourage friends and relatives to do likewise. The reaction needs to run its course and not to be suppressed.

3. The activity of the persons involved needs to be great. Acceptance and presence are needed more than active reassurance.

4. A major effort is needed to prevent development of a feeling of discontinuity between past, present, and future. The event must be made a bridge between past and future, and the person must be encouraged to reconstruct the past in relation to the present, even in the face of continuing emotional outbreaks and the beginnings of realistic contemplation of the future. It is important that children, if involved, be given the same opportunity.

This phase is of variable length and its subsidence is gradual, but a duration of seven to ten days should not be considered abnormal. Probably the most important part is the emotional ventilation—which is the part that, in general, our culture most tends to suppress.

The Period of Social Reconstruction.—The period following the phase of recoil is the time of social reconstruction; and if the second phase has been worked through properly, the bereaved person is able to utilize to the fullest extent the social forces around her to reconstruct a social role without undue emotional flattening or clinging to the ways of the past or to wishes for them. This is the period of rehabilitation.

Comment.—If the grief reaction is not worked through, it may subside into a condition of chronic tension or depression or guilty preoccupation that will require definitive psychiatric intervention. If this is necessary, it is much more difficult than the thoughtful and courageous psychiatric first aid that might have obviated it at the time of the catastrophe. Psychiatrists have struggled hours on end to achieve a resolution of delayed grief reactions in depressed, dependent, self-pitying individuals in whom the same result could have been achieved by a brief effort at the time of the catastrophe.

References

1. Tyhurst, J. S.: The role of transition states—including disasters—in mental illness. Symposium on Preventive and Social Psychiatry. P. 149. Washington, D. C., Walter Reed Army Institute of Research, 1958.
2. Lindemann, Erich: Symptomatology and management of acute grief. Am. J. Psychiat., 101:141-148 (Sept.) 1944.

The Child with Strabismus

The "cockeyed" child, often exposed to ridicule, may suffer serious psychic scars as well as permanent loss of vision if his condition is neglected. The author stresses the role of the family physician in early recognition of ocular deviation.

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THE PROBLEM of strabismus is becoming increasingly important to all of us as physicians, since we are confronted more and more with the tiny patient whose parents are distraught because of some abnormality in his ocular movements. Articles in lay magazines and newspapers are causing an increasing awareness of the importance of early diagnosis and treatment of any bodily infirmity, and certainly strabismus is not the least of these, since its early recognition and treatment are of paramount importance.

The child at school age who has evident strabismus has two strikes against him, because he not only looks different from his classmates but also he may act abnormally because he is aware of this difference. Ridicule by playmates is frequent, and this may produce psychologic difficulties of which the parents are completely unaware. To witness the profoundly beneficial effect of treatment on the appearance and personality of the child, as well as on the attitude of the worried parents, is in itself sufficient evidence to convince one of the necessity for early treatment.

This general discussion is concerned with the mechanisms by which strabismus may occur, the available methods of treatment, the role of heredity in such cases, and the extremely important role played by the family physician in the recognition of this deformity. Several questions of interest to both physicians and parents will be discussed.

Mechanisms of Strabismus

The eyes at birth are small, as are the other members of the body; being small, they are hyperopic, or "far-sighted." Since the retinal nerve cells are not fully developed for many months, the newborn cannot see clearly, and the eyes tend to wander rather freely. When the child is three or four months of age, the fovea, or area for central vision, is developing, and the child begins to look at large objects located more by feel than by actual focusing of the eyes. At six months of age, the eyes should be functioning rather well as a team, and this ability for binocular coordination (fusion) should be well established at the age of twelve to fifteen months. The ability of the eyes to accommodate, or focus, so that objects may be seen clearly, develops somewhat more rapidly than does visual acuity; by the age of two or three years, however, both have attained a relatively mature state. To permit perception of an object near at hand as a single image, the eyes must converge as accommodation occurs, and these functions are closely related physiologically. If a child has eyes that are unusually "far-sighted," an excessive amount of accommodation is required to obtain a clear image, and excessive convergence results.

Therefore, any hindrance to the development of normal vision or a requirement for undue work by the accommodative mechanism can set the stage for failure of the eyes to work as a team, thus leading to strabismus. Abnormal deviation of the eyes may be present in different forms and arise from a variety of causes. Most frequently, there is convergent strabismus (esotropia) or divergent strabismus (exotropia), and either type may be constant or intermittent. Vertical deviations occur less frequently.

The ophthalmologist frequently sees an infant whose eyes appear to turn in excessively when he glances to one side or the other. Examination by means of pupillary light reflexes reveals the eyes to be perfectly straight, the cause of the apparent squint being the broad epicanthal folds (frequently noted before the bridge of the nose develops) behind which the eye is hidden. The possibility that actual deviation is present at times should not be discounted too readily, however; follow-up examinations are often required.

From the Section of Ophthalmology, Mayo Clinic, Rochester, Minnesota.

Any actual deviation of the eyes from a parallel position is an indication for a thorough ophthalmologic examination to determine the possible cause, especially in those instances in which the squint is present at birth or develops shortly thereafter. Several questions come to mind. Is the condition the result of some congenital defect of the external ocular muscles or the result of an injury during delivery? Is there some intraocular defect of a congenital nature, or has a tumor of the eye produced a visual deficit and hence the strabismus? Perhaps there is evidence of choked disk, signaling the presence of some abnormal intracranial process. All of these possibilities must be eliminated before the diagnosis of strabismus resulting from some simpler cause is made. Fortunately, the majority of these patients have no other serious defects.

Convergent Strabismus (Esotropia)

More frequently, the tendency to convergent deviation does not become evident until one, two or even three years of age. At first, the deviation may be intermittent when the child is tired, ill or angry, but often it becomes constant. Should the vision remain equally good in each eye, the result probably will be an alternating type of esotropia that persists until some type of treatment is instituted. In many instances, one eye deviates constantly. In order to prevent confusion or diplopia, the brain suppresses the image from the convergent eye and, if the deviation is left uncorrected, deep suppression, or amblyopia, develops. If amblyopia remains past the age of six years, permanently reduced central acuity results in most instances. This reduction of visual acuity (usually 20/200 or less) is commensurate with industrial blindness and could be a great handicap to one desiring a skilled position in industry or aviation, or in a profession that requires excellent binocular vision.

Those patients who have convergent strabismus from birth or shortly thereafter usually require surgical correction. If one eye converges constantly, it is probable that the vision is reduced through suppression, and the other eye must be totally occluded for a time to ensure the development of equal vision in the two eyes before any surgical intervention is undertaken. Any large degree of hyperopia found by cycloplegic refraction also should be corrected by spectacles to determine the effect on the amount of deviation prior to operation. If benefit is not derived from this conservative treatment, an operation is in order. In this type of patient, unusually heavy check ligaments or muscular adhesions often are found that may have prevented the eyes from being straight.

In most instances, the age of onset of esotropia is about two or three years, the period at which visual acuity and accommodation reach a useful level. Since a child's world is nearby, excessive hyperopia requires additional accommodation, and nature's method of solving the confusing problem of balancing the simultaneous excessive convergence is to permit the less dominant eye to turn in. This is termed "accommodative esotropia," and it is the type best suited to conservative treatment. In the majority of patients with intermittent or alternating esotropia beginning at this age, an abnormal degree of hyperopia is discovered by cycloplegic refraction, and the full correction by spectacles often results in normal alignment of the eyes, since there is no longer an excessive stimulus for accommodation and convergence. If one eye turns constantly, equal vision must be regained through occlusion. Should some degree of squint remain after a period of conservative treatment, surgical treatment to correct only this residual deviation is in order.

Divergent Strabismus (Exotropia)

Divergent strabismus, or exotropia, although less frequently encountered in children, is nonetheless a defect that is usually amenable to early treatment. This type of divergence also may be intermittent or constant, but it is intermittent in the majority of cases. The age of onset is variable, ranging from birth to several years but averaging two to five years. The constant type is more commonly noted at an extremely early age, and these children seldom exhibit development of fusion if treatment is not instituted. Patients with intermittent divergence frequently have the common symptom of extreme sensitivity to sunlight, and the parents may note that the child closes one eye or shields his eyes when he is out of doors. In this type, the eyes tend to diverge more as the patient looks at a distance than when he looks at near objects, and there may be poor binocular function for distance but excellent fusion for near vision. The reason for

this is not completely understood but probably it is related to the greater accommodation and convergence required for near vision.

In either the constant or intermittent type of exotropia, conservative treatment is usually of little value. A lens correction for existing hyperopia aggravates the tendency to divergence, while correction of any myopia may improve it. If constant exotropia is present, surgical treatment to gain parallelism of the eyes should be performed as early as feasible, and certainly before the age of six years, if binocular function is to be attained. Although intermittent exotropia usually requires a somewhat different surgical approach, early intervention is still essential, since the intermittent tendency gradually becomes constant.

The surgical treatment of intermittent exotropia is particularly gratifying, since reduction of the tendency to divergence is the usual result, and the fusion mechanism secures a foothold.

Actual training of binocular coordination as a conservative means of treatment enhances fusion ability (if some is already present) in some patients, but it does not alter appreciably the amount of deviation, whether convergent or divergent. It is probably most useful in patients with the divergent type of strabismus to improve convergence ability and fusion after operation.

Comment

The following questions are frequently raised and warrant some discussion. Who is qualified to examine and treat children with strabismus? Only the physician who is specifically trained in ophthalmology and ophthalmic surgery should do so. Treatment by nonmedical personnel is not warranted or advisable. How early should treatment of strabismus be instituted? The best time is just as soon as the deviation is noted. Even at six months of age, it is possible to determine whether or not a squint is present in most cases; if so, some form of treatment can be started. Actual occlusion of one eye, and it must be total occlusion by means of a patch over the eye, may be started satisfactorily by the age of twelve to eighteen months. Frequent examinations are essential during the period of occlusion to be certain that the occluded eye is not becoming amblyopic. By eighteen months, a child with a refractive error will accept glasses readily, and they should be worn during all waking hours. Glasses and occlusion often are used together. Once equal vision is established and glasses have been tried, an operation may be performed to correct the remaining squint; should other means of treatment not be found necessary, surgical intervention may be used to correct all of the squint. Although opinions among ophthalmic surgeons vary as to the earliest age for operation for strabismus, most agree that it is imperative to have proper alignment of the eyes before school age if the child is to have an opportunity to develop fusion.

What is the goal of surgical treatment? It is principally to obtain parallelism of the eyes plus binocular function when conservative means of treatment have not sufficed or are deemed unnecessary. A good cosmetic result is gratifying, but one must strive also for the perfect result of fusion in daily life. Early treatment is the key to successful treatment; the concept, "leave him alone and he will outgrow it," is ill advised.

Many parents are extremely anxious to know how long their child will have to wear glasses. The only honest answer is just as long as they are needed to aid in acquiring and maintaining straight and normally functioning eyes.

The question of heredity in strabismus arises frequently. It is doubtlessly true that both exotropic and esotropic persons are found in succeeding generations when a family history of squint is present. The descendancy is sporadic, however, and not easily predicted. The accommodative type of esotropia is the variety most frequently encountered on a hereditary basis, although it is often difficult to obtain a family history from reluctant parents, who much prefer to blame their child's squint on some childhood disease or injury.

Conclusion

From this discussion, it is evident that a primary requisite in the treatment of strabismus in children is early diagnosis. Here, the family physician plays a most important role, since often he is the first to be consulted by the parents. Patients in whom the diagnosis is doubtful, as well as those who have obvious defects, should be thoroughly investigated. Every physician must be alert to this frequently occurring problem, so that preservation of sight and a properly functioning team of eyes may give those children with strabismus the same advantages enjoyed by those without a similar defect.

Surgery in Cardiac Patients

Major surgery in a cardiac patient is not an infrequent occurrence in these days of increased longevity and improved medical and surgical care. Here, the author gives criteria for establishing whether or not a patient is a good surgical risk and offers guidance for preoperative and postoperative care and the choice of anesthesia for surgery in cardiac patients.

THE CONSTANTLY increasing average age of our population and the natural increase in degenerative heart disease, coupled with better surgical techniques, improved anesthesia, and effective antibiotic therapy, have brought about a situation where major surgery in a cardiac patient is a very common occurrence.

Whereas infections such as pneumonia previously proved to be the "friend of the aged," these patients are now cured by antibiotics and live on; whereas intestinal obstruction carried a high mortality in the past, nasal suction, antibiotics and better ionic control have kept the patient alive. Inasmuch as about 85 per cent of the men in this country at the age of fifty have some coronary disease, it becomes obvious that situations will arise which will necessitate surgery in patients not only with asymptomatic coronary disease but in those patients with either cardiac failure or myocardial infarction. It is estimated that at least 750,000 persons with new cases of coronary thrombosis recover each year and attempt to go back to work. These individuals will develop the usual surgical conditions in the same proportion as normal individuals.

In the past, surgery in cardiac patients carried a very high mortality. Sprague[1] found a mortality of 13 per cent in 170 cases. Butler, Feeney and Levine[2] found a mortality of 6.3 per cent unexpected deaths. Hickman, Livingstone and Davies[3] found 1.7 per cent deaths in 345 operations. Brumm and Willius[4] found a mortality of 4.3 per cent in 259 cases. Morrison[5] found 9.9 per cent mortality in 311 cases, while Hannigan[6] found 5.2 per cent mortality in fifty-eight cases. Baker, Grismer and Wise[7] found a mortality of 5.7 per cent in cases with healed myocardial infarction—the mortality in acute infarction ranging from 50 to 80 per cent. It is interesting as one reads the literature to find that those statistics which were reported ten or fifteen years ago carried a higher mortality than those from more recent years.

In order to determine the present situation, the records of St. Barnabas Hospital (Minneapolis), were compiled for one year. Five types of surgery were selected for this report, namely, cholecystectomy, gastric resection, prostatic resection, hysterectomy, and open reduction of hip fractures. In order to be certain that we were dealing with patients with a very high probability of having coronary disease, only those over the age of sixty were included. There were thirty-three cholecystectomies in this series with two deaths both due to infection. There were twenty gastric resections with two deaths, one due to coronary thrombosis and the other due to unknown causes. Of thirty-

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five prostatic resections, there was only one fatality, and this was due to pulmonary embolism of unknown cause. There were twelve hysterectomies with no deaths. There were thirty-one open reductions of the hip with no cardiac deaths, with one death due to pulmonary embolism as a result of phlebitis. Two patients in this series died of cerebral vascular disease later while in the hospital but not immediately after surgery. Therefore, of 131 patients, there was one death, or 0.76 per cent, due to a known cardiac cause. There was one death, or 0.76 per cent, due to unknown cause, and two deaths, or 1.52 per cent, due to pulmonary embolism. If we assume that all of these were on a cardiac basis, the mortality still would only be 3 per cent. Assuming that at least 85 per cent of these patients had coronary disease, the cardiac mortality amongst those would be only 0.9 or 1 per cent as a certainty, and 3.6 per cent as an outside possibility if we included the cases of pulmonary embolism and the death from unknown causes.

Before going further in the selection of cardiac patients for surgery, it might be well to have a look at what we know of the extra work entailed for the heart in anesthesia. Actually this data is very difficult to obtain on a scientific basis. It would appear that the oxygen consumption is not much elevated by anesthesia, and the work of the heart is closely correlated to oxygen consumption. To be sure, there are increased work factors produced by certain positional changes of the heart and great vessels. Also, the draping of the patient during surgery will necessitate an increased blood flow through the skin required to lower the body temperature. This increases cardiac output. From a practical standpoint it would seem that the work of the heart during surgery is no more than that which is incurred when the patient is up walking around.

My first contact with the problem occurred about twenty-five years ago. For some reason no longer remembered, the surgical service at the Minneapolis General Hospital suddenly began to ask for cardiac evaluation prior to surgery. This was understandable in cases of elderly persons or in known cardiacs. It became rather obnoxious when requested in young individuals with no shred of evidence for heart disease. Even more discouraging was the fact that due to oversight on the part of an ambitious surgical resident these consultations were frequently requested at unreasonable hours such as 11:00 p.m. prior to an 8:00 a.m. surgical case—that patient having been in the hospital for days waiting to get on the schedule. It was then that the medical consultant needed some protection from unnecessary consultations, and we usually ended our consultation with the words, "This patient will have no difficulty in good surgical hands." Despite the facetious tone of this statement at the time, it still tells the story. The good surgeon will have the cardiac status of his elderly or known cardiac patient evaluated, but even more than that, he will listen to the advice of his consultant concerning the preoperative and postoperative care.

The examination to determine the cardiac status need not be elaborate. Above all, a good history in itself will solve many of the problems. If a patient gives no history of anginal pain, dyspnea on exertion or edema, then his functional capacity is usually very high and he should have no difficulty under ordinary conditions of anesthesia or surgery. Even if a history of dyspnea, angina

or edema is present, as long as the individual can walk a few blocks or climb one flight of stairs at a walk, the chances are high that he will not have difficulty in surgery.

The history of a hypertension causes great concern among surgeons. I personally am not at all alarmed by such a history as long as the functional capacity seems adequate. To be sure, the presence of hypertension carries with it a high percentage of coronary disease; but again, if the function is adequate, this will cause no trouble.

A history of rheumatic fever or chorea, although interesting, is not a great factor unless valvular disease exists, and then only under certain conditions.

Examination of the heart for the evaluation is simple. X-ray examinations of the chest reveal cardiac size. The actual measurement of the transverse diameter can then be compared with the predicted transverse diameter from the Ungerleider and Clark Tables to determine whether or not the heart is enlarged. Any transverse diameter more than 10 per cent above the predicted value is considered to indicate cardiac enlargement. Although theoretically not correct, for the practical purposes of this discussion, we may assume that a heart is normal in size whose transverse diameter is less than 50 per cent of the transverse diameter of the chest. Heart failure will occur only rarely in hearts normal in size, the most notable exception being acretia cordis. If the heart is over 50 per cent of the chest diameter, it may be enlarged. In some circles, such enlargement is considered cardiac failure even though actual signs of congestion are absent, and in those circles this so-called compensated failure will require digitalization. I, personally, would be prone to await developments before digitalizing a minimal cardiac enlargement without failure but can find no fault with those otherwise inclined. In these days of rapid intravenous digitalization, I feel that we are perfectly able to adequately care for actual failure if it occurs.

The electrocardiogram has become a must in cardiac evaluation — perhaps more by tradition than by value. This is not to say that it is of no value, but I feel that its usefulness is highly overrated in this particular situation. To be sure, a majority of acute coronary closures will be demonstrated by this method. For that reason it has a place. On the other hand, it is unnecessary in determining functional capacity. The presence of this or that pattern becomes a fine scientific point. It bears very little practical relation to the problem at hand. I grant that the presence of a normal electrocardiogram is a great assurance, but the mere presence of a chronic electrocardiographic abnormality is not sufficient to eliminate the patient from necessary surgery.

In the field of arrhythmias the electrocardiogram is very helpful, although, as a rule, such arrhythmias may be diagnosed clinically.

Determination of the blood pressure is a part of the examination. Actually an elevated blood pressure in itself is not a sufficient reason to defer surgery. On the other hand, as I have indicated, it does carry with it a statistical tendency to coronary disease.

The examination of the heart with the stethoscope will give information regarding rhythm, heart sounds and murmurs. Valvular heart disease not in failure causes no great problem in surgery except for aortic stenosis. This lesion, with its great left ventricular work-load and poor coronary filling due to a low aortic pressure, cannot be dismissed lightly. Although the work-load in anesthesia and surgery is not greatly increased, any drop in blood pressure or oxygen tension could prove disasterous. Most other valvular lesions when compensated should cause little difficulty.

The arrhythmias can be troublesome. The presence of an auricular fibrillation increases the surgical mortality considerably. There are statistical studies which show a mortality of 40 to 50 per cent following surgery on such individuals. I do not believe that this is true today with adequate digitalization and better postoperative care.

Ventricular premature beats, although not necessarily pathological, are an indication of increased hyper-irritability of the ventricle. For such patients the choice of anesthetic is limited. Certainly cyclopropane, which in itself produces this arrhythmia, is to be avoided. If the premature beats are frequent enough, treatment with quinidine or pronestyl may be indicated preoperatively.

Auscultation of the lungs for the rales of passive congestion must be carried out. The presence or absence of edema can easily be ascertained. Palpation of the right upper quadrant will determine the presence of liver enlargement. These few short tests will be adequate to determine whether or not significant cardiac failure is present.

The examination having been made it now becomes necessary to determine which patients may

undergo surgery. The following categories may be established:

1. All patients without symptoms or signs of functional inadequacy as evidenced by dyspnea, pain or edema may be operated under proper circumstances.
2. Patients with failure who have been previously compensated by medication are operable.
3. Patients with cardiac enlargement of over 55 per cent of the chest diameter may be operated after therapy.
4. Patients with auricular fibrillation or frequent ventricular premature beats will require therapy before surgery.
5. Patients with marked angina of effort or excitement or those with status angiosis will have an increased mortality and require extreme caution to avoid any lowering of oxygen tension or drop in blood pressure.
6. Acute myocardial infarction carries a high operative mortality and must only be subjected to surgery if the condition requiring the surgery has a higher mortality in itself—which is extremely rare.

The preoperative care of the cardiac is not difficult. Congestive failure requires adequate digitalization and diuresis to eleminate the failure. A definite decrease in salt and fluid intake will be required. The arrhythemia such as auricular fibrillation, auricular flutter and excessive premature beats should be treated and the patient adequately protected with drugs during anesthesia.

Above all, the preoperative care of the cardiac patient requires much psychological reassurance. These patients are more than ordinarily anxious about impending surgery. They have heard about the terrible things which happen to cardiac patients in surgery, and their natural anxiety only increases their problem. The work of the heart and incidence of arrhythmias are all increased by such anxieties. A very reassuring approach on the part of the surgeon and the cardiologist will do as much for the cardiac patient who is to undergo surgery as all medications combined. The display of anxiety concerning the patient's condition on the part of his physicians can be disastrous.

The choice of anesthesia is important. Certainly any anesthetic which decreases oxygen tension is to be avoided. This would immediately eliminate nitrous oxide. These forms of anesthesia, such as spinal, which have a tendency to drop blood pressure are to be avoided in patients with coronary or aortic heart disease. They should also be avoided in those whose blood pressures may have been high for years and in whom cerebral circulation has already adjusted to the high value and cannot adjust to a low value. As already indicated, cyclopropane is not to be used in individuals with arrhythmias such as premature beats.

Postoperatively, the surgeon must remember that his patient is a cardiac. In those with previous failure or minimal cardiac enlargement, excessive amounts of fluid and salts are to be avoided. I am certain that many a patient has met an untimely death by reason of over-hydration after surgery. The amount of fluid exchange required daily is not excessive. Cardiac patients get along adequately for years on a daily fluid intake of 1,200 to 1,400 cc. There is no reason why that same patient will require an intake of 2,500 to 4,000 cc. just because of surgery. I am certain that many more cardiac patients die by reason of over-hydration than ever die by reason of dehydration. If intravenous fluids are needed, the avoidance of sodium will do much to avoid accumulation of fluid in the tissue. Mercurial diuretics are not harmful and may be used daily in order to produce adequate urinary output.

Above all, a surgeon must remember that cardiac therapy required before surgery must be continued after surgery. The difficulties in the postoperative period are just as great as in the time prior to or during surgery.

References

1. Sprague, H. B.: The heart in surgery; analysis of results of surgery on cardiac patients during past ten years at Massachusetts General Hospital. Surg., Gynec. & Obst., 49:54, 1929.
2. Butler, S., Feeney, N. and Levine, S. A.: The patient with heart disease as a surgical risk. J. A. M. A., 95:85, 1930.
3. Hickman, J., Livingstone, H., and Davies, M. E.: Surgical and anesthetic risk in cardiac disease. Arch. Surg., 31:917, 1935.
4. Brumm, H. J., and Willius, F. A.: The surgical risk in patients with coronary disease. J.A.M.A., 112:2377, 1939.
5. Morrison, D. R.: The risk of surgery in heart disease. Surgery, 23:561, 1948.
6. Hannigan, C. A., Wroblewski F., Lewis, W. H. and LaDue, J. S.: Major surgery in patients with healed myocardial infarction. Am. J. M. Sc., 222: 628, 1951.
7. Baker, H. W., Grismer, J. T. and Wise, R. A.: Risk of surgery in patients with myocardial infarction. A.M.A. Arch. Surg., 70:739, 1955.

The Pelvic Stress Syndrome

● *Here is a common ailment of women which has been quite successfully treated by the author using oral testosterone. Many a physician has tried a wide variety of approaches to this problem, and here is a treatment that can be expected to give a fairly high percentage of good results.*

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THE PELVIC stress syndrome is a clinical entity characterized by backache, lower abdominal pain and frequently associated with premenstrual tension (headache, irritability, breast engorgement and fluid retention), menorrhagia, metrorrhagia and fatigue.

Incidence

The exact incidence of this sydrome has not been determined but in the experience of the author, it was found in more than one third of all gynecologic patients seen in the office. It may be present at any age during the active menstrual life of the female but is more common in the pre-menopausal or early menopausal age group. Table I shows the incidence in a group of 200 unselected patients. In this study, no patient was older than fifty-six years of age.

Parity is related to incidence only on an age basis for, in general, parity tends to increase with age. The effect of parity on incidence in this same group of 200 women is shown in Table II.

TABLE I. FREQUENCY

Age Group	Number	Per Cent of Total
15-19	1	0.5
20-24	4	2.0
24-29	12	6.0
30-34	26	13.0
35-39	77	38.5
40-44	52	26.0
45-49	18	9.0
50-55	10	5.0
Totals	200	100.0

TABLE II. PARITY

Parity	Number	Per Cent of Total
0	19	9.5
1	31	16.5
2	46	23.5
3	56	28.0
4	28	14.0
5	12	6.0
6	4	2.0
7	3	1.5
8	1	0.5
Totals	200	100.0

No conclusions could be drawn as to the relationship of race to incidence since all but three of our patients were Caucasians.

Etiology

No single etiologic factor was found to explain the entire syndrome although many of the objective findings indicated that an increase of estrogens may have been an important causative factor. Taylor, in 1949,[1] interpreted similar findings and symptoms as being of vascular origin. However, it can definitely be shown that neither infection by any known agent nor a neoplastic process are

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a part of this condition. At the present time, an experimental project is underway in an attempt to prove the estrogen hypothesis.

Symptomatology

The outstanding complaint of patients exhibiting this syndrome was backache (Table III). It was present in 194 (97 per cent) of the women in the study group. It may be the only symptom but frequently it is associated with others.[2] It may vary from a dull, intermittent, inconstant, low, nagging type of pain to a severe, sharp constant one. Typically, it was present in the lumbosacral, sacroiliac or sacral regions and often radiated to the posterior aspect of one or both thighs.

Almost as common was the complaint of abdominal pain in 190 women (95 per cent). Typically, this was lower abdominal in location, in one or both lower quadrants. It, too, may vary from a dull, inconstant ache to a severe, constant, knife-like pain. In a much smaller number, pain was generalized throughout the abdomen (8 or 4 per cent) while in seven other women, it was confined to the upper abdomen, especially the epigastrium. In only five patients inconstant nausea, vomiting, diarrhea or constipation were outstanding complaints and frequently such symptoms were not present on consecutive days. They had no constant relationship to food, menses or urinary function. The abdominal complaints seemed to be identical to those described in other tension states. Dyspareunia because of pelvic pain was also relatively common (54 per cent).[2]

Associated with backache and abdominal pain were the symptoms comprising premenstrual tension. In order of frequency these were premenstrual breast enlargement and tenderness (61.5 per cent), abdominal enlargement or "bloating" (59.5 per cent), nervousness and irritability (57.5 per cent), mental depression (32 per cent) and peripheral edema (21.5 per cent), especially in the lower extremities and an increased desire for salt or salty foods. Some patients noted in the week or ten days prior to menses, that they had to increase the size of their brassieres and, less commonly, a few complained that in this same period their shoes no longer fit. It should be noted that although some of the study group were concerned about sizable weight gains, all such women admitted to compulsion or "nervous" eating.

The fourth most frequently-noted group of of the features of adenocarcinoma such as scant,

TABLE III. SYMPTOMS

Symptom	Incidence	
	Number	Per Cent of Total
Backache	194	97.0
Abdominal pain	186	93.0
Both lower quadrants	101	50.5
Right lower quadrant only	48	24.0
Left lower quadrant only	12	6.0
Upper quadrants only (one or both)	10	5.0
Generalized	8	4.0
Epigastric region only	7	3.5
Premenstrual tension	126	63.0
Breast engorgement	123	61.5
"Bloating" or "gas"	119	59.5
Nervousness and/or irritability	115	57.5
Depression	64	32.0
Peripheral edema	43	21.5
Menstrual irregularities	107	53.5
Shorter cycles	89	44.5
Premenstrual spotting	84	42.0
Menorrhagia	43	21.5
Postmenstrual spotting	41	20.5
Total irregularity	16	8.0
Infertility	99	49.5
Fatigue	95	47.5

symptoms was menstrual irregularity. More than half (53.5 per cent.) of our group noted menstrual changes. Progressively shorter cycles was the usual complaint although many of these patients also observed premenstrual spotting of from one to seven days' duration, usually described as a dark brown or "dirty" discharge. Forty-three (21.5 per cent) of the group experienced prolonged or profuse menstrual flow with one or more periods (not always consecutive). Curettage was done on the majority of these women as will be noted below. Forty-one (20.5 per cent) complained of postmenstrual spotting of from one to five days' duration and in sixteen women (8 per cent) total irregularity of both cycle and flow was present.

Almost half of the group (ninety-nine) manifested infertility.[3] However, this complaint was most difficult to evaluate since many women in our group, especially those in the premenopausal age group, were actively trying to avoid pregnancy. Of the others, infertility represented one of the main reasons for seeking medical aid, originally. The duration varied from one to nine years and of the patients who were concerned about their inability to achieve pregnancy, almost two-thirds (sixty) had at least one child.

Unusual fatigue was present in ninety-five (47.5 per cent) of the patients. A much larger number mentioned fatigue together with the general symptoms of stress but in the group under discussion, fatigue was present out of proportion to effort or exertion.

Findings

Pelvic examination revealed tenderness particularly in the adnexal regions and in the sacro-uterine area. This was found in all patients in this series but the degree varied considerably and could usually be related to the length of time that symptoms had been present. Less than 10 per cent had sacro-uterine tenderness without other pelvic sensitivity, but in 84 per cent, thickening of the sacro-uterine ligaments was found. One hundred and seventy-three (86.5 per cent) of the group had third degree retroversion of the uterus which was found to be relatively immobile in practically all cases. Attempts at reposition without anesthesia were usually unsuccessful only because of the severe pain this maneuver produced. No other consistent pelvic findings were present although an average number of small, silent myomata, vaginal infections and cervical erosions were discovered.

Abdominal tenderness was found in 190 (95 per cent) of the 200 women, without accompanying muscle spasm or rebound tenderness. The location of the tenderness corresponded to the site of symptomatic discomfort although in thirty-two women, it was more generalized than the pain would indicate.

Laboratory studies were of significance only from a negative standpoint. White blood cell, differential and red blood cell counts as well as sedimentation rates were all within normal limits. Papanicoloau smears were class 1 and 2 smears. Cultures for gonococcus were taken in about half of the patients (ninety-nine) and were negative. Seventy-six women were subjected to curettage because of abnormal bleeding or spotting. The pathological diagnosis in all instances was proliferative endometrium even though surgery was performed in the presumed premenstrual phase, where possible, or during the prolonged bleeding stage. In ten instances, there was stromal hyperplasia without accompanying glandular enlargement.

In forty-six patients, an opportunity to examine the peritoneal cavity (especially the pelvis) on the operating table occurred during the period of this study. Surgery was performed in fourteen cases for conditions other than gynecologic ones (cholecystitis with cholelithiasis, possible ruptured peptic ulcer and acute appendicitis) while the remaining thirty-two women were explored because of severe pain which did not respond to therapy or under the erroneous diagnosis of ruptured ectopic pregnancy or endometriosis. In all of the forty-six, the pelvis was free of infection, endometrial implants or other significant pathologic findings. Third degree retroversion was present in thirty-five instances (75 per cent) but none of these uteri were fixed and they could be easily elevated into an anterior position.

TABLE IV. RESULTS

Classification of Results	Study Group		Control Group	
	Number	Per Cent	Number	Per Cent
Markedly Improved (Asymptomatic)	167	83.5	0	0
Moderately Improved	23	11.5	31	15.5
Unimproved	10	5.0	169	84.5

Treatment

Since it has been established that testosterone is an antagonist to estrogen, male hormone was administered to members of the study group. Empirically, it was decided to limit the dose to a maximum of 300-350 mg. per month to minimize possible side effects since this has been shown to be the critical level above which such side effects appear. A sublingual tablet was selected and an initial dose of 6 mg. twice daily was established after other amounts had been tried. As improvement became evident (both subjectively and objectively), the daily dose was gradually reduced until a maintenance level was reached. In the majority of our patients, this was found to be between 1.5 and 3 mg. daily.

As a control to the study group, a tablet of the same size, shape and color (composed entirely of lactose), was given to another group of 200 women. With this exception, the control group was identical to the study series.

Results

The results in the study and control groups are shown in Table IV. These findings were tabulated after ninety days of therapy. It should be noted that there is a latent period of at least fourteen days before improvement is noted by either the patient or the physician. Thereafter, amelioration of symptoms and pelvic findings is usually slow but progressive, reaching a maximum in from forty-five to seventy days, depending largely on the length of time the condition had existed prior to initiation of therapy.

It is readily apparent from Table IV that after

three months of testosterone therapy, 95 per cent of the study group were either markedly improved (asymptomatic) or moderately improved as contrasted to only 15 per cent of the control group who claimed moderate symptomatic improvement although, clinically, no change was found upon pelvic examination.

It is interesting to note that this improvement could be maintained indefinitely on a maintenance dose of testosterone, whereas, if the medication were discontinued after a period varying from eight months to two years, both the symptoms and objective findings returned. However, this recurrence was again reversible with resumption of the medication. Twenty-eight patients (14 per cent) became pregnant after from three to ten months of therapy. These women had all originally sought medical care because of infertility rather than pain.

Minor side effects occurred in ten patients (5 per cent). Five complained of increased hirsutism while four developed acne and one woman noted both of these complications. Medication had to be discontinued in six other patients because it produced nausea. The acne disappeared rapidly after testosterone was stopped but the hirsutism has persisted. No other untoward effects were noted.

Differential Diagnosis

Four other conditions producing some or all of the symptoms and/or findings found in the pelvic stress syndrome are to be differentiated from it.

The lack of localized tenderness, abdominal muscle spasm and rebound tenderness will most often allow *appendicitis* to be excluded. Further aid may be obtained from the blood counts, sedimentation rate and pelvic findings.

Elevated sedimentation rates, leukocyte count and a change in the differential count as well as other evidences of infection (increased temperature and pulse rate) will be present in *acute salpingitis* but not in the stress syndrome. Positive cultures for gonococci or other pyogenic organisms may further aid in differentiation.

In *ectopic pregnancy*, a history of amenorrhea with the subsequent appearance of abdominal or pelvic pain and bleeding are present but absent in pelvic stress. Symptoms of shock (due to intra-abdominal hemorrhage) are never present in the stress syndrome.

Strictly speaking, *endometriosis* is a pathologic diagnosis and differential diagnosis is easy since there are no pathologic findings in the stress syndrome. At surgery, endometrial implants are specific for endometriosis. Clinically, however, these two conditions may be indistinguishable.

Discussion

The name pelvic stress syndrome was selected by the author because of the association of the pelvic symptoms and findings with those of other stress conditions (abdominal, premenstrual, et cetera). It is similar, if not identical, to Taylor's vascular syndrome.

No claim is here made that testosterone will do more than arrest the condition. The only "cures" noted have been in those women in whom ovarian function has been destroyed, naturally or artificially. Nor is any claim made that testosterone will eliminate the associated infertility although, as has been noted, twenty-eight women in the study group did become pregnant after three or more months of therapy. The importance of this study lies in the elimination of pelvic distress and backache while maintaining ovarian and menstrual function.

Summary

A clinical syndrome called pelvic stress syndrome characterized by backache, lower abdominal pain, tension states, menstrual irregularities and fatigue has been described.

Incidence, symptoms, findings, treatment and differential diagnosis have been given.

The results of treatment in a controlled series consisting of 200 women are given.

Acknowledgment

The author wishes to thank Mr. M. Cain and the Ayerst Laboratories for their contribution of the Testosterone Lingusorbs® used for some of the patients in this study.

References

1. Taylor, H. C., Jr.: Vascular congestion and hyperemia. I. Physiologic basis and history of the concept. Am. J. Obst. & Gynec., 57:211, 1949. II. The clinical aspects of the congestion-fibrosis syndrome. Am. J. Obst. & Gynec., 57:637, 1949. III. Etiology and therapy. Am. J. Obst. & Gynec., 57:654, 1949.
2. Parsons, L.: Pelvic pain. Postgrad. Med., 23:252 (March) 1958.
3. Gidro-Frank, L., and Gordon, T.: Reproductive performance of women with pelvic pain of long duration. Fertil. & Steril., 7:440, 1956.

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Intracapsular Fracture of the Hip

The Use of Substitution Femoral Head Prosthesis in the Primary Treatment

Treatment of fresh fractures of the femoral neck by excision of the femoral head and introduction of a prosthesis is advantageous in elderly patients. Fifteen patients so treated are discussed briefly.

LESTER W. CARLANDER, M.D.
Minneapolis, Minnesota

Presented as an Inaugural Thesis before the Minneapolis Academy of Medicine on October 21, 1957.

THE PROBLEMS presented by an elderly person with a fracture of the hip are familiar to all. Fractures of the hip are generally divided into two broad classifications: the intracapsular fractures, in which the fracturing is in the neck of the femur within the capsule of the hip joint itself; and the fractures of the trochanteric area, variously termed intertrochanteric, pertrochanteric and subtrochanteric.

The trochanteric fractures, in general, may pose a more difficult problem in stabilization or immobilization. With adequate treatment, however, they usually will heal and we do not usually see necrosis of the femoral head develop when the fracturing is in this location.

With intracapsular fractures of the femoral neck, we are usually faced with a fracture which needs to be reduced and secured in this position of reduction by means of internal fixation in order to obtain healing of the fracture. However, even though the fracture heals, a considerable number of these hips will develop avascular necrosis of the femoral head because of impaired blood supply to the femoral head due to the site of the fracture.

A case typical of this problem might follow a course such as this: An eighty-year-old lady fell and suffered an intracapsular fracture to her hip. The day following, this was reduced and internally fixed. A period of convalescence followed during which time the patient could be up in a chair but she was not allowed weight-bearing in any form. Healing was followed by x-rays and after a period of perhaps three to six months postoperatively, healing appeared satisfactory and the patient was allowed to bear weight on this leg. This might be followed by a period of a few months to a year or more without discomfort and then the patient begins to develop aching pain in the groin, hip, or thigh with walking and x-ray shows avascular changes in the femoral head with flattening or crumbling of a portion of the weight-bearing surface. We are once again faced with a patient who is at least partially a hip invalid and who requires treatment which may vary from limitation of activity, partial protection

of hip by use of cane, osteotomy of femur to change the weight-bearing thrust in the hip, arthroplasty of the hip, or insertion of a substitution femoral head prosthesis.

In any consideration of this problem it is, of course, important to know about how often this complication occurs. In various reviews of series of intracapsular fractures of the hips treated by various means of fixation, it would appear that there are between 10 and 15 per cent of the intracapsular fractures of the hip which fail to unite for one reason or another and of the remaining fractures which do heal, various series show 25, 33, and 40 per cent incidence of avascular necrosis of the femoral head developing later.

During about the last fifteen years, various femoral head prostheses have been developed for treatment of major difficulties in the hip arising from severe changes in the femoral head. Much credit should go to the Judet brothers in Paris for their early work in development of an endoprosthesis for the femoral head. They used a stem type of prosthesis which was much like a mushroom in shape and the stem simply inserted down the neck of the femur after removal of the head. Through the subsequent years, many various types of prostheses have been developed and used. Some of these have been developed of various plastics and others of stainless steel alloys or Vitallium. Some of them have been stem type in that the stem passes down only through the neck of the femur, others have been intramedullary in type in that the prosthesis inserts through the neck and down the medullary canal of the shaft of the femur. In general, the plastic prostheses have not worn well and there is a definite incidence of reaction to them. The consensus of opinion also rather generally favors the use of the intramedullary type of prosthesis which affords a more complete anchoring and therefore greater stability of the endoprosthesis.

Because it so often seemed unsatisafctory that an elderly person with a fractured hip would spend so many of his remaining days a hip invalid, numerous orthopedists have tried to see if the use of a femoral head prosthesis as the original treatment of the intracapsular fracture of the hip would be a satisfactory alternative.

We have had occasion to follow this form of treatment in a number of patients during the last two years. We have confined this type of therapy to the more elderly group because we still feel that for the patients with a considerable life expectancy ahead, it is worthwhile to try for a healed fracture and hope that aseptic necrosis will not develop.

This paper is devoted to a brief evaluation of fifteen such patients treated in the period of one year, all at least six months ago. This number of cases is far too small for this paper to be a statistical review. Evaluation of the results are in terms of what it has meant to the patient in terms of activity, not detailed studies of range of motion. The outcome in any individual case must be considered successful or unsuccessful as compared to what could be anticipated. For example, in a patient who is partially disoriented, requiring rest home care, and who, prior to his fractured hip, has only walked from the bed to the wheelchair and to the bathroom, a good result would be to once again return him to this degree of ambulation where he can walk a bit and be relatively independent and does not have to be lifted and cared for as a bed patient.

Evaluation of Patients

Age.—A quick survey of these fifteen consecutive patients reveals that their average age was seventy-nine years.

Length of Hospitalization.—The average hospital stay postoperatively was fifteen days. All patients at the time of dismissal from the hospital were ambulant to some degree with assistance.

The Operation.—The operative procedure as performed on these patients consisted of a lateral approach to the hip with the patient lying upon the opposite side, a release of approximately the anterior one-third to one-half of the gluteal medius and minimus attachment to the trochanter, an anterior arthrotomy of the hip, and then dislocating the hip anteriorly. The head is removed from the acetabulum and the ligamentum teres or any other soft tissue at the base of the acetabulum is removed. The neck is then prepared for the insertion of the prosthesis, and the prosthesis of proper size inserted, checked to see that it fits well, and then reduced into the acetabulum. It has been my practice always to test the hip while the capsule is open to be sure that external rotation will not easily dislocate the hip again. The capsule is then closed, the muscles

reattached to the trochanter and the wounds closed.

Type of Prosthesis.—In all of these fifteen patients an Austin-Moore type of intramedullary prosthesis was used. This is a metal prosthesis, cast from Vitallium, with fenestration in the shaft portion through which subsequent bony growth may give further stabilization. At all operations we have the Minneapolis prosthesis available because, in its present form, we feel it is an equally excellent prosthesis and actually is preferable if for any reason the Austin-Moore prosthesis seems loose in the shaft after insertion.

Operative Risk.—As can be seen from the average age of seventy-nine years, this procedure has been carried out on the very elderly. It is a larger surgical procedure than reduction and pinning of a hip in which it is not necessary to open the capsule. However, it does not take any longer in operative time and can often be done more quickly. The average operative time for these patients from a start of operation to completion, including skin closure, was about seventy minutes. About 40 per cent of these fifteen patients received one pint of blood with their surgical procedure. It has been our belief that, unless the patient is actually moribund or in such poor general condition making highly improbable his survival during the immediate convalescence, he will tolerate this procedure. The anesthesia which has typically been used in this group has consisted of spinal block, using between 6 and 10 mg. of pontocaine. Sufficient reinforcement has been used simply to dose any patients who are apprehensive.

Mortality.—Two of the patients are deceased, both of them succumbing during their postoperative convalescence. One of these patients was an eighty-five-year-old lady who appeared to tolerate the procedure very well and had a good convalescence until the tenth day when she died of a coronary occlusion. The second was an eighty-five-year-old man who had fallen in the rest home where he was being cared for because of age and disorientation. Subsequently, in his convalescence the patient developed first an abrasion and subsequently an open sore on his elbow from rubbing on the sheets which then flared into a severe cellulitis of the arm. We were unable to control the inflammation with chemotherapy and the patient expired the seventeenth postoperative day. The hip wound, incidentally, healed well and was not involved in this process.

Complications.—Aside from the above deaths, one patient's convalescence was complicated by development of a low grade phlebitis of both lower extremities. There have been no infections in this group although, subsequently, one patient developed a septic wound. There have been no dislocations of the prothesis.

Postoperative Care.—Postoperatively, these patients have not been immobilized in any apparatus. Early motions have been encouraged commensurate with the patients' condition. They are allowed up in a chair within the first few days and allowed walking with support by the end of the week. It is found easier to ambulate some of the very disoriented patients with two people helping them from either side; others may use the walker, and others learn to use crutches. Assisted walking with a prosthesis is, of course, much easier since the patient is allowed partial weight-bearing on this leg, whereas, with a fracture which is pinned, we need to avoid all weight-bearing and this is very difficult for many elderly people.

Present Status of Patients.—As has been suggested previously, the end result in some of these situations may seem inadequate unless we continue to bear in mind that one purpose of the procedure may justifiably be simply to lessen the care required by the patient.

One patient, an eighty-year-old man, continues to receive rest-home-care and does not walk upon his leg. He is helped up daily and divides his time between the bed and the wheelchair. This patient is disoriented and uncooperative due to cerebral arteriosclerosis. He has developed a flexion contracture of the hip from constant sitting and lying in bed with the hip flexed. Physical therapy was advised early, but the family deemed that the patient was so uncooperative and out of touch with reality that sufficient benefit would not be forthcoming.

Two other patients continue to have rest-home-care because of moderate degrees of disorientation due to cerebral arteriosclerosis. The one patient, a seventy-five-year-old lady, is doing very well and apparently has no pain. She is up daily. She is not allowed to walk by herself because it is felt she cannot be trusted. She does walk from bed to wheelchair, to the bathroom, and about the rest home simply with someone at her arm. The other patient, an eighty-five-year-old man,

continues at the rest home where he resided at the time of his fall. He is independent in his care. He uses two canes much of the time when he walks. He is able to get in and out of the bathtub himself, is able to negotiate stairs himself, and complains of no pain.

Two of the patients complain of definite discomfort in the hip with walking. Both patients are at their homes and are partially ambulant during the day. The one patient, a seventy-eight-year-old lady, walks about the house usually holding onto furniture, is independent in her care as far as dressing in the bathroom and getting around her home. She complains of discomfort in this hip after being up and is also partially handicapped by pain of arthritic nature in the opposite hip and both knees. The other patient is an eighty-five-year-old lady who is markedly kyphotic in build and needs to be propped up constantly in bed to rest and breathe comfortably. She is the patient who developed swelling in both legs with low grade phlebitis. It has been my feeling that her position requiring constant flexion of the hips may have been a factor in this. She is at home, walks to the bathroom, around the house by herself using a cane or holding onto the furniture and gets in and out of bed without being lifted. She has discomfort in her hip for which she uses aspirin. She also has discomfort in her back which is independent of her hip trouble.

The remaining cases are as follows:

One patient is an eighty-year-old lady who is somewhat disoriented and disturbed. The day following her operation she was out of bed walking and sufficiently active so that she threw a pitcher of water through the hospital window. She went home in ten days because it was felt that she might be less disoriented there. At the present time she walks around her home usually using a cane. She helps with the housework to a mild degree. She dresses and cares for herself. She has no pain but she states that she tires easily, describing this as a general tiredness.

A seventy-nine-year-old woman is at her own home and continues to care for it. She can walk without support but prefers to use a cane because she feels more sure of herself. She goes up and down stairs, cares for herself and her home, describes slight swelling in the foot if she has been on it a great deal during the day. She states that she has no discomfort.

A seventy-seven-year-old man, who now has gone back to live by himself, cares for himself and his home. He gets up and down stairs. He uses a cane when he walks. He has some discomfort in the leg for which he uses Absorbine Jr.

An eighty-three-year-old woman who is living at her children's home, states that she has some aching at night until she gets settled comfortably. She tends to use one crutch a good deal of the time around the house. She cares for herself, gets up and down stairs without assistance, and helps keep house for her children, both of whom work.

A seventy-two-year-old woman, had a radiation fracture following x-ray treatment for an adenocarcinoma of the uterus. The fracture was not immediately recognized until it displaced, at which time we saw the patient and elected to treat her with a primary prosthesis. This patient is ambulant, walks most of the time without cane or crutches, and has, I believe, been to California and back visiting. She describes some aching in the hip after working in her garden, but in general has done very well.

A seventy-one-year-old lady, who had a very high subcapital type of fracture, at the present time walks well without support and without appreciable limp. She is active, cares for her home and describes some aching in her hips and knees which is bothersome but not handicapping.

A seventy-nine-year-old woman, who, at last report was doing very well—was active, walking with or without cane, was having no pain or discomfort and was caring for her home and herself.

Finally, a seventy-one-year-old woman who did very well postoperatively, at last report wrote that she was having no pain, was walking daily and was independent in her care.

Indications for the Use of Primary Prosthesis In Intracapsular Fractures

At the present time, it is my feeling that the possible indications for the use of reconstruction of the hip by insertion of a femoral head prosthesis in the primary treatment of an intracapsular fracture are as follows:

1. Very advanced age of the patient where it makes possible early ambulation and some degree of independence during their remaining life.

2. When the patient is somewhat disoriented or incapable of full co-operation. As we all know, such patients cannot be prevented from getting out of bed unless they are restrained or constantly supervised. Such immediate weight-bearing has to be avoided after the fixation of a fracture, but does not appear to be any great calamity after the insertion of a prosthesis.

3. The patient, who, because of age, general feebleness, impaired vision, or impaired use of extremities such as after cerebral vascular accidents, is going to be unable to use crutches effectively without weight-bearing during the period of four to six months after surgery. Many of these patients will be able to walk with support where they can bear some weight on both legs, and in this way use of primary prosthesis may greatly lessen the amount of care that they require in their home or rest home.

4. We feel somewhat more inclined to use a femoral head prosthesis in fractures which are of the extreme sub-capital type although this paper

has not attempted to evaluate the indications for use on basis of the site of fracturing in the neck in the intracapsular fractures.

Conclusions

In conclusion, I would feel that the following statements with regard to the use of a primary prosthesis are probably justifiable: (1) That a primary prosthesis does not give as normal or painless a hip as a well healed fracture which does not develop avascular changes in the head. (2) That a prosthesis does allow early ambulation of the patient facilitating the care of the very elderly patient. (3) That the use of the primary prosthesis does avoid the complication of avascular necrosis in the healed fracture. (4) That the prosthesis will allow most patients to be independent in care of themselves, to be ambulant to the degree required of their years, and may avoid major "hip invalidism" during their waning years.

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Discussion

RICHARD E. REILEY, M.D.: This paper is an excellent paper and demonstrates the type of conservative thinking which is fairly prevalent in this area. It demonstrates very clearly the careful selection of cases. The tendency in many areas is to become enthusiastic about a gimmick which has not been given thorough evaluation. It has been proven in the past and we are all well aware that there is no substitute for an intact femoral head which has remained viable following a fracture of the neck.

The main consideration in these instances is that of an elderly patient with a hip fracture. In many instances this represents an economic catastrophe. It involves periods of long hospitalization and care and, in many instances, what small resources these people have are used up and their care depends upon a city, county or state agency or relatives who are in no position to care for the patient, either personally or financially. Thus far, no definite age limitation has been set. It was originally set at seventy years as an arbitrary figure but there has been a great variation in the age of the patients involved in whom hip prostheses have been used. Most hip prostheses have an advantage in several ways in that they do not require x-rays during the surgical procedure and consequently surgical time can often be reduced rather substantially when a prosthesis is used. As far as surgical approaches are concerned, this seems to be an individual matter. We have found that the posterior approach is easier for us although many are using the posterolateral approach or a lateral approach and the anterior approach. Indications for the use of a hip prosthesis have to be considered individually. However, we consider the patient who is a hemiplegic with a fracture of the neck of the femur on the hemiplegic side to be an absolute primary indication for the use of a femoral head prosthesis.

During the development of prostheses it has been shown in the past that the plastic materials which have been used, such as nylon, have proved to be entirely unsatisfactory. Materials now most commonly used are Vitallium and stainless steel. We see no particular advantage of one material over the other and feel that this is simply a matter of choice on the part of the surgeon. During the development of the Minneapolis prosthesis, originally the femoral heads were removable and were obtainable in various sizes. The stem-portion of the prosthesis was made in two sizes and the heads were also made in different diameters, and simply the diameter which fitted the acetabulum properly was selected and screwed onto the stem-portion of the prosthesis. However, this procedure was discontinued after one patient had the stainless steel head unscrew within the hip joint. Many of these patients have had spectacular results such as one sixty-seven-year-old woman, a diabetic, who sustained a fracture of the neck of the femur followed by a nonunion of the neck fracture after which a prosthesis was inserted. One year later she fractured the neck of the opposite femur and since it was a fracture low in the neck, it was fixed by internal fixation. The fracture promptly fell apart and the prosthesis was inserted some three months after the original fixation of the fracture. This patient now attends dances regularly, bowls, and does all of her own housework and gardening.

In one other instance, white man aged twenty-six, with rheumatoid arthritis and ankylosis of both hip joints, had bilateral prostheses inserted and is now self-sufficient and is working.

In conclusion, I think this is an excellent paper that demonstrates a conservative and individualized approach to the treatment of the elderly patient with a fracture of the femoral neck.

JOHN H. MOE, M.D.: I appreciated hearing Dr. Carlander's paper, and do not have anything specific to add to what he has said. A ten-year or fifteen-year follow-up may show that the acetabulum will wear away from a metal prosthesis. It would appear to me that in the presence of long-standing conditions where the hip has not been used adequately and a considerable amount of bone atrophy is present, or in the event that a reaming out of the acetabulum is necessary in the insertion of the prosthesis, that the tendency toward complications of pain and wearing away of the acetabulum are much greater than they are in the fresh fracture. The use of the prosthesis in the fresh fracture appears to give excellent results for the most part. I think that Dr. Reiley is to be congratulated on his excellent work in the development of a good prosthesis, and I would also wish to congratulate Dr. Carlander on an excellent presentation of a timely subject.

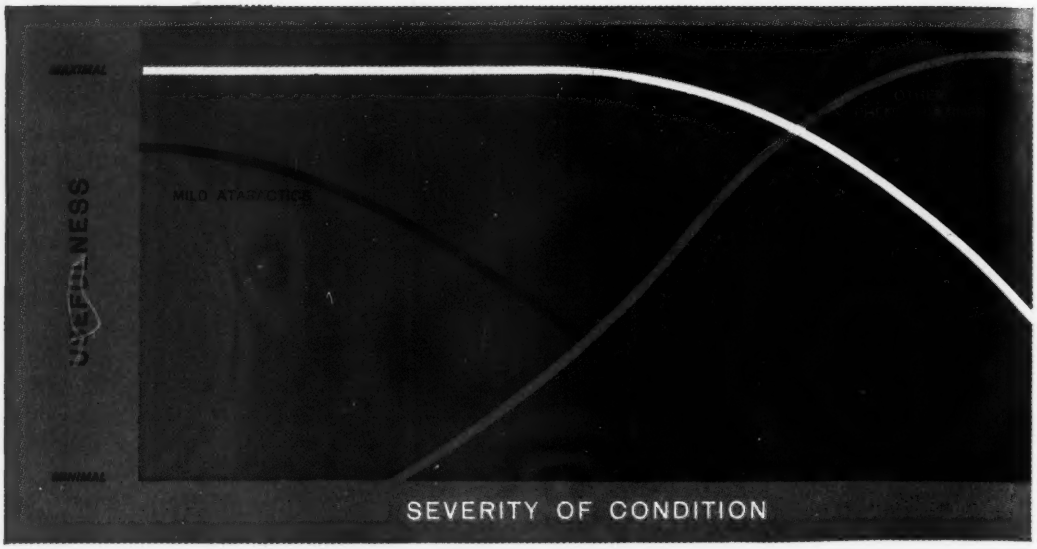
D. KEITH MILLETT, M.D.: I believe that Dr. Carlander is to be congratulated on delivering a very excellent paper on a very timely subject. There is no doubt that the replacement femoral head prosthesis has a very definite place in the treatment of sub-capital fractures of the femur, especially in elderly patients. The operation can be carried out easily and quickly with very little increase of operative risk over that involved in pinning the fracture hip. The convalescence is generally much more rapid, favoring earlier ambulation and usually greatly decreasing the convalescent nursing care required. I believe the operation, as presented by Dr. Carlander, should be in the armamentarium of every surgeon treating hip fractures. I want to thank Dr. Carlander again—it was a very excellent paper.

LESTER W. CARLANDER, M.D.: (closing discussion): I wish to thank the discussants of the paper for their fine comments and to re-emphasize, as brought forth in the body of the paper, that we feel that where there is a possibility of many years of use of the hip in the future, that the advantage of an uncomplicated healed fracture is sufficient, so that the standard treatment by internal fixation of these fractures in this situation is still preferable.

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M.S.M.A.

Meno-metrorrhagia, when due to atypia of the endometrium, presents an extremely delicate problem of diagnosis. Is the atypical endometrium benign, premalignant or frankly malignant?

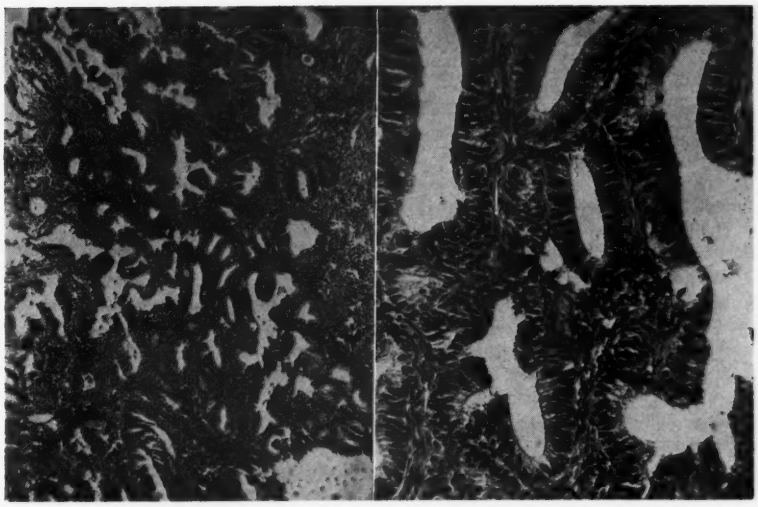


Fig. 1. *(left)* Uterine curettings showing atypical endometrial hyperplasia.
Fig. 2. *(right)* Higher magnification of Figure 1.

Atypical Endometrial Hyperplasia in the Young Woman

RICHARD R. FLIEHR, M.D.

Minneapolis, Minnesota

Inaugural thesis presented before the Minneapolis Academy of Medicine, April 21, 1958.

IT IS NOT DIFFICULT to distinguish pathologically between definite adenocarcinoma and cystic hyperplasia of the endometrium. There exists however, a "middle-ground" between the two that has become, in recent years, a matter of great concern to pathologist and clinician alike. This is the so-called atypical endometrial hyperplasia or "carcinoma *in situ* of the endometrium" as termed by Hertig. It presents many of the features of a typical hyperplasia—the profusion of glands, the moderate cystic formation of these glands, and the tendency to polypoid overgrowth. It also has many of the features of adenocarcinoma such as scant, dense stroma, intraluminary glandular projections, anaplasia, numerous mitoses, stratification of the glandular epithelial cells and the like.

In young women, where conservation of childbearing organs is paramount, this represents a grave and perplexing problem. Such cases in young women are uncommon, but they are present; and when encountered they must be treated with a concerted, yet conservatively adequate, plan of attack.

It is the aim of this paper, then, to review what little is known of the subject, add another case report to the literature, and attempt to justify some rationale of treatment that will prove adequate and safe.

Report of Case

This case is that of a white woman, aged twenty-eight, married, who was first seen in our office on November 5, 1956. Her menarche had been at age thirteen, and apparently she had been a normal menstruating woman until the summer of 1950 when she began to have a rather continuous light uterine bleeding. She consulted no one about this for approximately a year until she

suddenly had a profuse hemorrhage which required curettage and several transfusions. This was done in Denver and the report of the curetted tissue was "endohyperplasia of the endometrium." Following this episode she had complete irregularity of her menses, going for periods of from three to four months without any bleeding, and then spotting for several days as well as experiencing profuse bleeding at intermittent periods. This continued until 1953 when she again had a dilatation and curettage in Honolulu. The report of this tissue was "adenomatous hyperplasia."

The patient's gynecologist in the Islands placed her on cyclic hormone therapy which seemed to help regulate her menses at first, but within a few months her periods again became completely irregular despite continued therapy. She was seen next in Palo Alto by a qualified gynecologist and again was curetted. I obtained these slides and the findings were an endometrium characterized by a dense stroma, scarcity of glands, and marked squamous metaplasia. Also of note were the anaplasia of cells and numerous mitotic figures. Her gynecologist termed this "icthyosis of the endometrium," which is rather an esoteric term but was evidently used as a description of the marked squamous metaplasia around the glands. As a matter of fact, one pathologist in reviewing these slides admitted that he would be sorely tempted to call this an adenoacanthoma, a frankly malignant lesion. Her Palo Alto physician took her off all hormone therapy and she had scanty monthly menses for seven months, when she again began having the same meno-metrorrhagia. A repeat curettage was performed at this time and the tissue showed a picture very similar to the previous curettings but with slightly more pronounced abnormal features.

This was in October of 1955, and she had no therapy but continued symptoms until seen in our office on November 5, 1956. I performed an office endometrial biopsy and got a rather typical picture of mid-menstrual endometrium with minimal adenomatous hyperplasia. Looking carefully, however, one could notice slightly more intraluminary budding of the glands than is usually seen in typically normal endometrium. The patient continued to bleed following the biopsy, however, so on January 7, 1957, she was hospitalized and a thorough curettage done. These were the findings that offered the great quandary (Fig. 1). Notice the budding into the glands. Now we notice the glands crowding out the stroma. In Figure 2, under higher magnification, one can see the stratification of the cells in the glands, and the numerous pale stained cells with pale nuclei.

Our pathologist reported this tissue as adenocarcinoma, but being somewhat dubious, he took them around to several other pathologists in the Twin Cities. The score came out about 50 per cent for adenocarcinoma and 50 per cent for an atypical form of hyperplasia. The slides were then sent to Dr. Malcolm B. Dockerty and Dr. Lawrence M. Randall at the Mayo Clinic, and to Dr. Emil Novak at Johns Hopkins. Dockerty and Randall were of the opinion that this was adenocarcinoma Grade I in an adenoma. Novak, on the other hand, could find no evidence of definite malignancy, yet frankly admitted that he could not say this tissue would not eventually become malignant. The results of all of these communications were presented to the patient, and on February 11, a total hysterectomy was done. The opened gross specimen showed nothing to cause great alarm other than a polypoid growth at the top of the cavity. Microscopic sections taken from the removed specimen showed essentially the same general picture as those of the curettage.

Discussion

It becomes obvious that this represents a lesion upon which pathologists and gynecologists cannot agree as to its malignancy. During the past decade —and even before—the subject has occupied some of the best minds in the country. Such men as Novak,[1,2] Hertig,[3,4] Speert,[5,6] Faulkner,[7] Aufwedson and Winblad,[8] and others have contributed to the literature on the subject.

What is there about this lesion that makes it atypical and the subject of concern to both the pathologist and the gynecologist? On this, all minds are agreed. Various combinations of the histological changes listed in Table I are always present.

TABLE I. HISTOLOGICAL CHANGES IN ATYPICAL ENDOMETRIAL HYPERPLASIA

Epithelial budding
Crowding of the glands
Lessened stroma
Tufts of epithelium protruding in the gland lumina
Outpouching of the glands
Stratification of the epithelial cells
Pale staining of the cells, especially the nuclei

Mitoses, even in fairly large number, are of very little help. The endometrium is a constantly changing and regenerating tissue. Mitoses are therefore very common, even in normal endometrium. Disparity in glandular size is also of very little significance. This also occurs in normal tissue, and very definitely is present in benign hyperplasia.

The entire subject resolves itself to the simple question of whether this atypical endometrial hyperplasia represents a pre-malignant lesion or not. Most gynecologists will agree that *any* form of hyperplasia, adenomatous or otherwise, in a *postmenopausal* woman who has not been receiving hormonal therapy is extremely dangerous. Total hysterectomy with bilateral salpingo-oöphorectomy is almost imperative in such cases. But what of a similar situation in a *young* woman? Especially if the woman is in the childbearing age and desirous of becoming pregnant?

Very little is known about the significance of

this lesion in the young woman, mainly because of the paucity of cases to study. Certainly we do know that adenocarcinoma of the uterus in the young woman is not as uncommon as originally reported. A study at the Roosevelt Hospital in New York[6] showed that 5 per cent of all cases of endometrial carcinoma were in patients under forty years of age. Since this age group represents a significant proportion of cases of malignancy, then the importance of attempting to recognize any pre-malignant lesion is doubly important.

Statistically, it is almost impossible to draw any conclusions from such a small number of cases reported in this category. Speert[5] reported sixteen cases of eventually recognized adenocarcinoma in which he reviewed previous curettings and found atypical changes in the endometrium. Three of these were in young women.

Hertig[3,4] reported in 1949 on sixteen cases of adenocarcinoma in young women. Five of these sixteen had one or more previous curettages which showed progressive change from simple hyperplasia through atypical adenomatous hyperplasia to frank malignancy.

TeLinde[9] has reported several cases which showed adenomatous atypical hyperplasia on curettage, yet when the uterus was removed, areas of frank malignancy were discovered coexisting with the hyperplasia. This makes the lesion even more alarming.

On the opposite side of the picture, however, Novak[2] has reported eighteen cases of atypical endometrial changes, eight of which had curettage alone and have remained well for from one to twenty-one years. Four of these eight were young women.

There is, then, no definite proof that adenomatous hyperplasia *per se* is necessarily a pre-malignant lesion. We know that different parts of the endometrium will react differently to estrogen over-stimulation—some areas showing simple cystic hyperplasia while others show the adenomatous type of overgrowth. Both of these will often respond to hormonal therapy. Even some atypical hyperplasias are capable of regression to normal endometrium if given amounts of progesterone at the proper time.

No one is agreed at just what point in the progress of the disease the pathology must be termed pre-malignant and irreversible.

Another point of issue is just what are we preserving if we do take a chance and leave the uterus in. As I have mentioned, this is done only in the case of young women in the hope that they will eventually have children. Yet all investigators agree that this atypical endometrium is attended by a high degree of sterility. In Speert's[6] study of fourteen young women with carcinoma of the endometrium, the most recent pregnancy among all fourteen had occurred fourteen years previously. Hertig also found sterility a concomitant factor. He further studied many of the resected ovaries in these cases and found a total absence of corpora lutea or albicantia in most of them. What then are we saving when we leave in a uterus with such an endometrium? At best we are saving a non-malignant organ which in all probability is incapable of carrying on its reproductive function; at the worst, an organ which is, or can, become pre-malignant.

From the small number of cases of atypical hyperplasia in young women reported to date, we can draw some fairly sound conclusions. We know that these patients almost always have a low degree of fertility. We have learned to recognize certain pathologic warning signs in tissue studies. What we do not know is which endometrium showing this type of picture will return to normal and which will continue on to undisputed malignancy.

Conclusions

With these facts in mind, and within the limited scope of our knowledge to date, the only possible rationale of treatment is an attempt to treat the disease as conservatively as possible. This means a trial of adequate hormonal therapy aimed at opposing the excessive estrogenic stimulation and restoring the normal cyclic hormonal balance. Curettage must be repeated at three-month intervals—no longer. If the disease is persistent, and especially if atypia becomes more pronounced, total hysterectomy is the procedure of choice. It is at this point that the decision to remove the uterus must be made and effected promptly. By so doing, a total hysterectomy is usually enough of a procedure. To delay further in the hopes of giving the uterus "another chance" may mean the difference between whether you can conserve the ovaries or not. To delay the interference in the progress of the atypia until a definite malignant change has occurred, condemns the patient to the added bilateral oöphorectomy with its concomitant climacteric.

(References are on Page 605)

Surgical Injuries of the Ureter

Presented as an Inaugural Thesis before the Minneapolis Academy of Medicine on October 21, 1957.

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Minneapolis, Minnesota

A MAJOR complication of surgery on the lower abdominal viscera and perineum is accidental injury of one or both ureters. The incidence of such occurrences in gynecologic surgery is estimated at about 2.5 per cent of operations for nonmalignant disease and up to 30 per cent of radical dissections for cancer (St. Martin).[1] The need for frequent discussions of the prevention, recognition and treatment of these lesions is obvious since this incidence is approximately the same as it was thirty years ago.

The following presentation deals largely with the analysis of twenty-nine cases of ureteral injury seen in private Minneapolis hospitals between 1946 and 1957. The majority were treated by Dr. Edgar A. Webb and Dr. Baxter A. Smith. Twenty-three cases of unilateral injury and six cases of bilateral injury were encountered.

Prevention of ureteral injury is much simpler than the cure. Surgeons operating on the female genitalia and lower colon should be keenly aware that such injuries can occur even when the operations are conducted by the most experienced operators. Preoperative investigation of the urinary tract by excretory urography and retrograde pyeloureterograms in patients where difficulty is anticipated will demonstrate the functional capacity of each kidney and delineate deviations in the normal course of the ureters. The preoperative passage of large-caliber ureteral catheters is probably the most effective method of prevention and will aid considerably in later identification and avoidance of the ureters. Every surgeon should be familiar with the normal anatomic relationships of the ureters and should realize that most injuries occur where the ureter crosses the iliac vessels and where the ureter is in close approximation to the uterine artery.

Once an ureteral injury has been discovered, the patient or his relatives should be informed of the condition and the treatment necessary for correction should be initiated. Although such injuries are recognized complications of pelvic surgery, an injudicious word by a consultant or hospital employe may potentially lead to medicolegal action. No

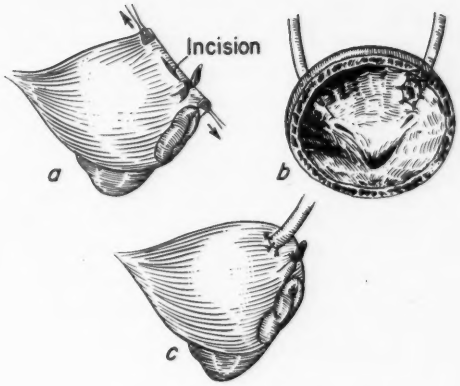


Fig. 1. Ureteroneocystostomy.

● *The prevention and management of ureteral injuries is of interest to everyone who performs abdominal and/or pelvic surgery. Here is an excellent and practical account of this subject.*

liability is incurred with a patient properly informed and correctly treated.

Ureteral injury occurs by clamping with a hemostat, ligating or suturing, angulation, partial or complete division, segmental resection and extensive stripping with subsequent ischemic necrosis. The resulting effect on the function of the involved kidney is of paramount importance. Findings and symptoms depend upon whether the injury is unilateral or bilateral, whether the occlusion is partial or complete, whether urinary drainage is intraperitoneal or extraperitoneal and whether infection is present or absent. (Creevy).[2]

TABLE I. ORIGINAL DIAGNOSES

1. Endometriosis	4
2. Uterine prolapse	4
3. Carcinoma of the uterus	3
4. Carcinoma of the colon	3
5. Ovarian cyst	3
6. Fibroid uterus	3
7. Carcinoma of the ovary	2
8. Enterocele	2
9. Carcinoma of the prostate	2
10. Intraligamentous cyst	1
11. Pregnancy	1
12. Unknown	1
Total	29

TABLE II. ORIGINAL OPERATIONS

1. Panhysterectomy	8
2. Abdominal hysterectomy	5
3. Vaginal hysterectomy	2
4. Oöphorectomy	2
5. Wertheim procedure	2
6. Enterocele repair	2
7. Radical perineal prostatectomy	2
8. Abdominoperineal resection	1
9. Anterior sigmoid resection and hysterectomy	1
10. Anterior sigmoid resection	1
11. Uterine suspension	1
12. Excision of intraligamentous cyst	1
13. Control of postpartum bleeding	1
Total	29

Original diagnoses which brought patients to operation and subsequent ureteral damage are listed in Table I. Original operations during which ureteral disruption occurred are listed in Table II. Various types of hysterectomies accounted for more

than half of the cases. Ureteral injury probably is more likely during difficult pelvic dissections attended by excessive bleeding and poor visualization of structures. Ureteral identification by means of inlying catheters at times such as this can be reassuring to any surgeon.

Immediate recognition of ureteral injury provides the most opportune time for repair. The appearance of an inlying catheter in the operative field, finding the severed proximal end of a ureter actively discharging urine, observing a ligature around the ureter or a hemostat clamped across the ureter indicate that injury has occurred. The surgeon should enlist the aid of an urologist who can help to identify the exact site of the injury quickly by passing ureteral catheters cystoscopically and who can advise with the ureteral repair and postoperative care. With an 8 French splinting ureteral catheter in place from the renal pelvis to the urethra, ligating sutures may be removed, incisions may be closed and elliptical end-to-end anastomoses may be performed. The ureteral catheter is anchored to an inlying urethral catheter and left in place for seven or eight days.

TABLE III. SYMPTOMS AND SIGNS*

1. Urinary leakage	12
2. Pain	3
3. Fever	3
4. Anuria and uremia	3
5. No symptoms	3
6. Abdominal distention	2
Total	26

*Observed when the ureteral injury was not recognized immediately.

A word of caution is given regarding intentional ligation of an injured ureter, a procedure to be condemned except in rare instances. Preliminary knowledge of the functional capacity of the opposite kidney is necessary and attempts at obtaining this information at operation under anesthesia are notoriously unreliable. Complete occlusion of a ureter to a noninfected kidney will cause hydronephrotic atrophy but similar treatment where previous infection exists may lead to urinary sepsis from infected hydronephrosis or pyonephrosis. Also, ligating sutures have been known to come loose with subsequent urinary fistulization. Urinary diversion by ureterostomy or nephrostomy is preferable to intentional ureteral ligation.

If the ureteral injury is not recognized immediately, characteristic symptoms and signs may appear later. Some injuries remain asymptomatic.

TABLE IV. REPARATIVE OPERATIONS

		Failures
1. Ureteroneocystostomy	10	0
2. Elliptical end-to-end anastomosis	6	3
3. Tubular bladder flaps	3	0
4. Deligation and ureterolysis	6	2
5. Vesicoureteroplasty	3	1
6. Cystoscopic fulguration of fistula	3	1
Total	31	7

Table III lists clinical findings encountered in our patients. Urinary leakage is usually vaginal but perineal and abdominal fistulae also occur. The finding most deserving of prompt attention is complete anuria in the early postoperative period. In such cases, the patency of the ureters should be determined by ureteral catheterization. Urinary diversion may be lifesaving if obstructive anuria is present.

TABLE V. NON-REPARATIVE OPERATIONS

1. Nephrectomy—primary	5
secondary	3
2. Intentional ureteral ligation	2
3. Emergency ureterostomy	2
4. Emergency nephrostomy	1
Total	13

Prompt urologic investigation is always necessary where ureteral injury is suspected. Preservation of functioning renal tissue is of prime importance and the fallacy of waiting for ligatures to dissolve or fistulae to close spontaneously has been demonstrated repeatedly. Accurate localization of the injury and appraisal of renal function are the chief prerequisites to adequate treatment.

Operative treatment of ureteral injuries may be classified into reparative (Table IV) and nonreparative (Table V) procedures. A total of forty-four definitive operations have been performed on our twenty-nine patients. The principals of treatment may be summarized as follows: (1) use of fine, absorbable sutures, (2) avoidance of tension on suture lines, (3) adequate tissue drainage with rubber drains, and (4) routine use of chemotherapeutic drugs. Splinting catheters are not employed as often as was formerly believed necessary (Hamm and Weinberg, Webb et al).[3-5] They are difficult to manage, lengthen the period of hospitalization and

encourage the development of strictures and persistent urinary infections.

Ureteroneocystostomy*

This procedure is feasible if sufficient ureteral length above the point of injury can be obtained to reach the bladder without tension. Ten successful operations of this type have been done, five without the use of splinting catheters.

Case 1.—A fifty-seven-year-old woman entered the hospital for abdominal enterocele repair. Preliminary ureteral catheterization was successful only on the right side; obstruction was met in the left intramural ureter. This was presumed due to scarring from a previous hysterectomy for fibroid uterus. During the operation, the left ureter was extensively dissected and bleeding was troublesome. Postoperatively, she had left lower abdominal pain and on the twelfth day vaginal leakage of urine occurred. An excretory urogram showed bilateral hydronephrosis with marked delay in the function of the left kidney. Retrograde pyeloureterograms demonstrated a left uretrovaginal fistula. Twenty-six days following the original operation, a left ureteroneocystostomy was performed. The ureter was found to be markedly dilated and the region of the fistula was encased in scar tissue. The ureter was severed just above this point and reanastomosed to the bladder through a small incision in the lateral wall. The full thickness of the ureteral wall was sutured to the bladder mucosa with 0000 chromic sutures. Supporting stitches were placed in the bladder and ureteral adventitia. A Penrose drain was left at the anastomosis site. No splinting catheter was used. An inlying urethral catheter provided urinary drainage for eight days. Some leakage of urine occurred from the incision for seven days and then ceased. Urinary infection was never bothersome. An excretory urogram nine months postoperatively was normal.

Elliptical End-to-End Anastomosis

This method is useful both for re-establishment of ureteral continuity after immediate recognition of ureteral division and for later repair. The edges of the ureter should be trimmed obliquely to provide a long suture line to discourage stricture formation. Failures have been attributed to urinary extravasation with subsequent periureteral fibrosis.

Case 2.—A sixty-nine-year-old man had the left ureter divided during an anterior resection of the sigmoid colon for adenocarcinoma. Cystoscopically an 8 French catheter was passed from the distal into the proximal ureteral segment, the edges of the ureter were trimmed obliquely and anastomosed with 0000 chromic sutures. The splinting ureteral catheter was brought out through the urethra. It was removed on the seventh postoperative day. Five months later his urinalysis was negative and an excretory urogram was normal.

Case 3.—A thirty-four-year old woman had a large endometrial cyst removed from the right broad ligament. The right ureter was divided where it stretched over the cyst. End-to-end anastomosis was done over a splint brought out through an opening below the suture line to the abdominal wall. Persistent urinary leakage and pyelonephritis occurred postoperatively. An excretory urogram showed a normal left kidney, marked stasis and hydronephrosis of the right kidney with ureteral dilatation to the pelvic brim. The caliber of the middle and lower portions of the ureter was diminished. A diagnosis of extensive periureteral fibrosis was made and an attempt

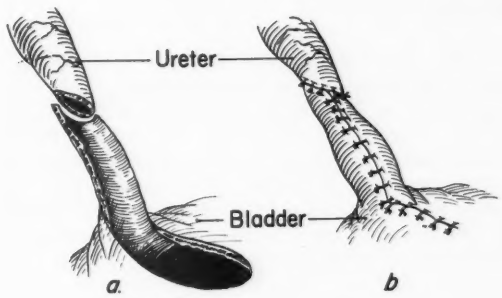


Fig. 2. Tubular bladder flap.

was made at secondary ureteral repair by dissecting the ureter out of the surrounding dense scar tissue. This also met with failure from urinary sepsis and fistulization. Right nephrectomy was performed eight months after the original injury had occurred.

Tubular Bladder Flap

Originally described by Boari and later revived by Ockerblad,[6] this operation makes possible the reconstruction of a long lower ureteral defect. A flap of anterior bladder wall is elevated with a broad base attached laterally to preserve blood supply. A tube is fashioned out of the flap which is anastomosed obliquely to the proximal ureteral stump.

Case 4.—A forty-two-year-old woman had no urinary output following a tedious bilateral oöphorectomy for endometriosis. Attempts at ureteral catheterization met obstruction in the left intramural ureter and the right catheter passed into the peritoneal cavity. Abdominal exploration showed excision of extensive segments of both pelvic ureters. Bilateral ureterostomies *in situ* were performed. Eighteen days later, after her general condition had improved, bilateral tubular bladder flaps were made and anastomosed to the proximal ureteral stumps. Her postoperative course was uneventful. Two years later the urinalysis was negative and an excretory urogram was normal. A retrograde cystogram showed saccular pro-

*See page 567, Fig. 1.

trusions of the bladder wall corresponding to the tubular flaps with free vesicoureteral reflux. She had no clinical symptoms, however, referable to this reflux.

Ureteral Deligation

In the early postoperative period, extensive attempts at deligating the ureter in patients already in incipient shock from long surgical procedures are attended by high mortality rates. Emergency urinary diversion is better judgment, followed later by ureteral repair. In selected cases, however, this procedure is feasible and prevents subsequent morbidity.

Case 5.—A thirty-six-year-old woman had the right ureter ligated during a vaginal hysterectomy. The injury was recognized immediately. Cystoscopy was performed on the operating table and while the urologist probed the ureter with a catheter, the surgeon removed the occluding suture. The catheter was passed to the renal pelvis and left in place for seven days. Three months later cystoscopy showed normal indigo carmine appearance from the right ureteral orifice.

Case 6.—A forty-eight-year-old woman had vaginal leakage of urine immediately following panhysterectomy. Her condition was good. An excretory urogram and bilateral retrograde pyeloureterograms showed slight right hydronephrosis, marked left hydronephrosis and dilatation of the ureter with considerable medial angulation of the lower portion. The abdomen was reopened, the left lower ureter was found caught in a reperitonealization suture which was removed and a splinting catheter was passed from the bladder to the left renal pelvis. The catheter was removed on the seventh postoperative day. Two months later the urine was normal and cystoscopic examination showed a good indigo carmine excretion bilaterally.

Vesicoureteroplasty

Dr. Baxter Smith suggested this procedure by which intramural and juxtavesical ureteral strictures may be corrected. The bladder is opened and the roof of the terminal ureter and overlying bladder wall are incised to a point above the stricture, thus incorporating the ureteral stricture into the bladder lumen. The edges of the ureter are sutured to the bladder mucosa. Splinting catheters have been employed but can probably be eliminated. The one failure in our series of three operations was in an instance with concurrent ureterovaginal fistula.

Case 7.—A forty-eight-year-old woman was anuric and became progressively uremic for six rays following panhysterectomy for cystadenocarcinoma of the ovary before urologic consultation was requested. The patient was acutely ill, the abdomen was markedly distended and the right kidney was palpable. The left ureter was obstructed to a catheter passed cystoscopically; a catheter passed up the right ureter entered the peritoneal cavity.

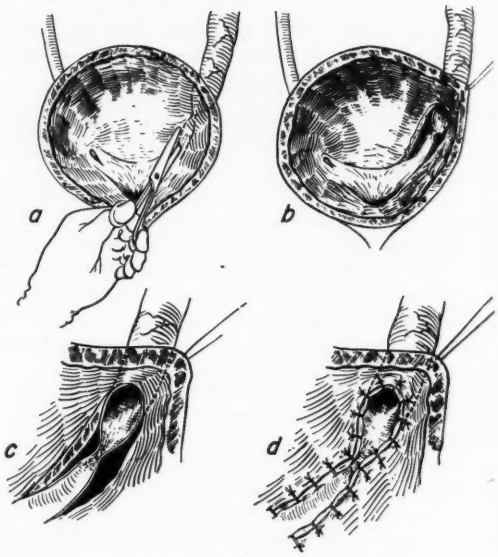


Fig. 3. Vesicoureteroplasty.

Right nephrostomy and drainage of urine from the peritoneal cavity were performed, followed in seventeen days by deligation of the left juxtavesical ureter. A small incision in the ureter was closed and a splint was left in place. The left ureter was apparently well healed when right nephrectomy was performed six weeks following the ureteral injuries. However, a left lower ureteral stricture subsequently developed which was corrected by vesicoureteroplasty one year later. Three years postoperatively the left kidney was normal by excretory urogram. She still has occasional episodes of pyelonephritis.

Cystoscopic Fulguration of Ureterovaginal Fistula

This has been employed successfully in two cases. One case similarly treated elsewhere and subsequently seen by us was a failure. The vaginal aspect of the fistula should be surgically excised.

Case 8.—Ten days after a difficult panhysterectomy for ovarian cyst, this forty-one-year-old woman had chills, fever, left renal pain and vaginal urinary leakage. Urologic investigation showed narrowing of the left juxtavesical ureter with an ureterovaginal fistula just above the stricture. Repeated ureteral dilatations relieved the stricture but the fistula persisted. Three months after the injury the fistula was visualized and fulgurated with an 11 French McCarthy infant panendoscope introduced

into the lower ureter. The tip of the electrode broke off but it was fortunately retrieved with small cystoscopic grasping forceps. The vaginal side of the fistula was excised. Urinary leakage promptly subsided. Four years later an excretory urogram was normal.

Primary Nephrectomy

Occasionally nephrectomy after ureteral injury is indicated when: (1) circumstances such as age, debility, concurrent disease and renal damage make the risks of repair impractical and (2) the opposite kidney is normal.

Case 9.—This forty-five-year-old woman had the right ureter completely occluded during panhysterectomy for endometriosis. She gave a long past history of psychoneurotic complaints. Right kidney pain, chills and fever had been occurring for nineteen postoperative days before urologic consultation was requested. The right kidney was nonfunctioning and the left kidney was normal by excretory urography. A hight ureterogram showed complete obstruction at eight centimeters. Right nephrectomy was performed. She has since been institutionalized for mental illness.

Summary

Twenty-nine cases of accidental surgical injury to the ureters have been analyzed and representative cases have been summarized. Methods of prevention, recognition, diagnosis and treatment of these injuries have been discussed.

References

1. St. Martin, E. D., Trichel, B. F., Campbell, J. H. and Locke, C. M.: Ureteral injuries in gynecologic surgery. J. Urol., 70:51, 1953.
2. Creevy. C. D.: Surgical injuries of the ureters. Bull. Univ. Minnesota Hosp. & Minnesota Med. Found., 25:440, 1954.
3. Hamm, F. C. and Weinberg, S. R.: Renal and ureteral surgery without intubation. J. Urol., 73:476, 1955.
4. Hamm, F. C. and Weinberg, S. R.: Experimental studies of regeneration of the ureter without intubation. J. Urol., 75:43. 1956.
5. Webb, E. A., Smith, B. A. and Price, W. E.: Plastic operations upon the ureter without intubation. J. Urol., 77:821, 1957.
6. Ockerblad, N. F.: Reimplantation of the ureter into the bladder by a flap method. J. Urol., 57: 845, 1947.

Discussion

DR. ROBERT TENNER: How do you destroy the blood supply of the ureter? What is the blood supply?

DR. PRICE: The ureteral blood supply is derived from three sources: (1) renal artery; (2) iliac artery; (3) vesical arteries. There are rich anastomoses between these branches in the ureteral walls. Extensive ureteral adventitial dissection is probably necessary for ischemia to develop, although why it does not always occur under these circumstances is not readily apparent.

DR. ROY SWANSON: In case of doubt can you open the bladder and slip ureteral catheters in and find injury?

DR. PRICE: Yes. Ureteral catheterization on the operating table either through a cystotomy or by cystoscopy is the best way to locate ureteral injuries that might be suspected during an operation.

DR. SWANSON: This paper is most instructive. I would like to add a point that has helped me. In difficult cases where an injury to the ureter is suspected, the bladder can be opened, and catheters inserted into both ureters without danger. This procedure will save you a lot of worry and possibly later surgery.

DR. EDGAR A. WEBB: When the urinary tract is injured during the course of an unrelated surgical procedure, and this injury most frequently involves the ureters, it is important that the attending physician make this information known to the patient immediately. If the patient's condition doesn't permit him to comprehend the nature and significance of the injury, then a concerned relative should be informed. Urologic consultation should be sought immediately when such injury occurs. Informing the patient completely and securing consultation immediately, accomplishes a great deal in maintaining satisfactory public and professional relations with the patient.

The reason for these immediate steps is that patients are often first informed of the injury by others than their physicians. Patients and relatives of patients are often inclined to assume that some incompetency has brought about the complication and are, therefore, hostile toward the physician. This is the substance from which malpractice suits are often developed.

The procedure of vesico-ureteroplasty such as illustrated so beautifully on Doctor Price's slide, should perhaps be referred to as the Smith Operation or Procedure. To my knowledge this particular plastic procedure is not described elsewhere and I believe that Doctor Baxter Smith adopted the principal to the problem of the strictures of the ureter in the juxtavesical or intramural portion.

Since we have given up the use of catheters for splinting repairs in the ureter and in the ureteropelvic junction and since we have abandoned nephrostomy and pyelostomy drainage by catheter the patients seem to get along better. Their hospital stay is shortened; they are more comfortable, and the urine returns to normal more quickly than when these splints are used.

Doctor Price has presented a well organized, timely and detailed report on surgical injuries of the ureter.

Urinary Diversion: Uretero-Sigmoidosto

A brilliant review and detailed study of a life-saving procedure.

DIVERSION of the urinary stream is a palliative or corrective necessity in many clinical conditions. Generally, it is a surgical problem based on many factors, leaving much to be desired in the end result, no matter what procedure is used to divert the urinary stream. Three essential conditions must be satisfied to make urinary diversion an ideal operative procedure: (1) Correction of the primary pathological problem or disease. (2) Preservation of normal renal function (if present prior to surgery). (3) Continence of the urinary and fecal stream.

Many procedures have been devised since attempts at such surgery first began to satisfy all three conditions, and all have been met with inconstant success. Indications for such an operation are not numerous but steadily increasing with ability to perform successfully more extensive and radical surgical procedures.

Urinary diversion is used in several conditions:

1. Exstrophy of the urinary bladder and epispadias.
2. Inoperable vesical-vaginal fistula.
3. Intractable interstitial cystitis, or post inflammatory fibrosis with vesical contracture.
4. Advanced vesical tuberculosis when all other forms of treatment fail.
5. Crushing injuries to the pelvis with extensive destruction of the male urethra, and/or bladder.
6. Advanced destructive and irreparable disease of the urethra ("watering pot perineum").
7. Extensive scarring or other irreparable damage of pelvic ureters due to surgery or radiation therapy.
8. Cystectomy for carcinoma of the urinary bladder or urethra.
9. Pelvic evisceration for extensive carcinoma of the pelvic organs.
10. Atonic bladder with ureterectasis with or without reflux.
11. Neurogenic vesical or sphincteric dysfunction.

This paper is directed primarily to carcinoma of the bladder in the male patient.

Principles and Historical Background

Search for a substitute for the urinary bladder is centered largely around the use of various portions of the bowel as reservoirs and conduits. Many years of experience involving experimental and clinical trial and error have demonstrated the real difficulties of providing a functional reservoir, and have elicited the factors responsible for dysfunction of the substitutes. Obstruction to urine flow, renal infection, and absorption of urinary constituents are the main problems. A true substitute for the bladder should protect the kidneys from infection, include non-interference with body fluid and electrolyte balance, permit intermittent evacuation of urine at reasonable intervals under voluntary control (and without the use of catheters or appliances) compatible with a normal social and physiologic existence.

An ideal ureteral-intestinal anastomosis must be based on the following principles: (1) Diversion of the fecal stream from the bowel reservoir to prevent ascending infection. (2) Elimination of obstruction at the site of anastomosis by a transplantation technique by the direct method. (3) The bowel reservoir receiving the diverted urine should not be too large. (4) The bowel reservoir

Continent Pre-anal Colostomy

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Presented in a Symposium on Urinary Diversion, Minneapolis Academy of Medicine, November 17, 1958.

should be either empty continuously or be emptied frequently, preferably by physiologic rather than mechanical means.

Proximal colostomy and implantation of the ureters into an excluded rectosigmoid pouch, a transplantation of the ureters into an isolated ileal segment or sigmoid loop appear to be operations with the potential to satisfy these criteria. We will present two cases of the first procedure using the modification outlined by Gersuny[1,8] in 1898 and recently by Lowsley and Johnson[3,4,5] avoiding the use of a colostomy.

Attempts to divert the urinary stream from a diseased bladder are not new. The first report of such an experimental and clinical procedure is said to have been that of Dr. John Simon in 1852.[2] Following experimental studies in dogs, he attempted clinically to divert the urine through a fistulous tract from man exstrophy of the bladder to the rectum. The procedure was performed on two patients and one died from peritonitis and the other from multiple urinary calculi and renal insufficiency, one year after the operation. In 1878, Thomas Smith tried a direct ureteral transplant into the bowel.[2]

It has been noted that the major difficulties associated with uretero-intestinal implants are due to stricture at the point of the anastomosis and to ascending urinary tract infection. The obstruction to the drainage of a hollow viscus anywhere in the body predisposes to infection. The end result with such a situation is hydronephrosis and hydroureter with pyelonephritis, and progressive renal insufficiency. Numerous attempts have been made to establish a valve-like mechanism at the site of the anastomosis for the purpose of preventing reflux of the intestinal contents into the ureter. These attempts have not been successful in preventing reflux and subsequent occurrence of an ascending infection. The success of diversional urinary tract drainage might well be dependent upon the formation of an artificial vesical that could be completely emptied at periodic intervals and that would not be constantly contaminated by the presence of fecal material.[6] The most ideal substitute would be an isolated segment of the bowel. Tizzoni and Foggi in 1888,[2] isolated a segment of ileum, closed one end and sutured the other end to the neck of the bladder, and implanted the ureters into this pouch maintaining sphincteric control and allowing the normal vesical sphincter to remain intact. It is seldom possible to remove the bladder and retain the vesical sphincter in neoplastic diseases, therefore the use of this operative procedure in man is necessarily limited, for such tumors frequently involve the trigone and require more extensive procedures and total cystectomy is a prerequisite to any anticipated cures.

In 1906 VerHoogan[2] formed a substitute urinary reservoir by using the ileal-cecal region with the appendix as a "urethra," hoping to make use of the muscular activity of the abdominal wall as a sphincter to control urinary leakage. In 1950, Bricker and Eisman[6] reported two cases in which the terminal segment of the ileum and cecum

were utilized for the vesical pouch. The ureters were transplanted into the ileal segment and a cecostomy was performed through which a catheter could be passed for evacuation of the newly formed bladder. In 1952, Merricks[7] described five cases in which a total cystectomy was performed and the ileal-cecal valve remained competent as a sphincter, using the cecum and terminal ileum for the new bladder.

Review of Procedures[2]

A review of procedures for urinary diversion seems appropriate at this time to develop the background of the Gersuny procedure, which we believe is an acceptable procedure for urinary diversion in some cases. Ureteral diversion of the urine may be grouped into the following classifications:

1. Non-intestinal
   a. To the skin
   b. To other structures
      (1) Urethra
      (2) Vagina
      (3) Fallopian Tubes
      (4) Uterus
      (5) Blood Vessel
      (6) Meninges of the spinal cord
2. Intestinal
   a. Into an excluded portion of the tract
      (1) Completely excluded portion
      (2) Partially excluded portion
   b. Into the intact tract

Non-intestinal methods of ureteral implantation are no more than temporizing measures and implantations to other structures are obviously without merit. The intestinal tract is therefore the obvious organ for a urine reservoir.

1. Implantation of the ureters into a completely excluded portion of the intestinal tract
   a. An artificial bladder made from the small gut
      (1) Placed under control of the vesical sphincter, experimental only (Tozzini and Goggi in 1888)
      (2) With the end brought out through the anal sphincter (Cuneo, 1911)
   b. An artificial bladder made from the entire rectum
      (1) Ileal-sigmoidostomy (Mauclaire, 1894)
      (2) *With the sigmoid drawn through the anal sphincter (Gersuny, 1898[1,8])*
      (3) With the excluded rectum made to communicate with the urethra for control by the sphincter (Lemoyne, 1912)
   c. An artificial bladder made from a pouch of the anterior rectum (Latheisen, 1899)
   d. An artificial bladder made from the ileal cecal region, the appendix serving as a urethra (VerHoogen, 1908)
2. Implantation of the ureters into a partially excluded portion of the intestinal tract
   a. The blind pouch of the lower ileum emptying into:
      (1) The ileum (Nagano, 1901)
      (2) The cecum (Goldenberg, 1904)
      (3) The transverse colon (Moskowicz, 1909)
      (4) The sigmoid (Berg, 1907)
   b. A blind pouch of short circuited loop of the sigmoid (Boreliaus, Berglund, 1903)
   c. A blind pouch of the sigmoid emptying into:
      (1) The lower sigmoid (Mueller, 1903)
      (2) The rectum (Muscatello, 1904)
   d. A blind pouch of the upper rectum (Descomps, 1909)

Comments on Common Procedures

1. *Cutaneous Ureterostomy.*—This is the most unesthetic and annoying procedure of all the diversionary methods. Continual problems of skin sensitivity to contact cement and reaction of the abdominal skin to pooling of urine from the ostea, stricture formation of the ostea, abscesses along the ureter, calculi, and/or retraction of the ostea beneath the skin surface coupled with odoriferous and cumbersome appliances doom the patient with this procedure to social solitude and economic and renal failure.

2. *Ureterosigmoidostomy.*—This requires no external appliances, but the pathophysiological shortcomings are many, chiefly those of regurgitation of mixed feces and urine from the bowel to the kidney because of the variation in rectal and ureteral pressures terminating in chronic pyelonephritis, progressive uremia and hyperchloremia. Pyelonephritis from obstruction and ascending infection is a common cause of tubular damage although back pressure alone may suffice in some cases. Hyperchloremic acidosis is due to absorption of the urinary constituents in the presence of renal tubular damage.

Although the role of the kidney in the acidosis of ureterosigmoidostomy has received considerable attention, the frequent clinical observation of reversal of the acidosis by rectal tube drainage is evidence against this concept. Other contradicting evidence is that greatly elevated serum chloride levels are seen with near normal non-protein nitrogen levels. Frequency of emptying the sigmoid of urine and voluntary low chloride and high water intake may explain some instances of patients who do not develop acidosis. The nature of the mucosa in the rectosigmoid and

the mechanics of flow over the mucosa must also be a factor. There may be a change of absorption function of the sigmoid mucosa after prolonged exposure to urine.

Patients with diversion of the urine to the colon regardless of how much colon is used or if only one ureter is transplanted, may lose potassium.[9-12] Hypopotassemia[11] (although it causes renal insufficiency and may produce weakness, lethargy and anorexia, hardly distinguishable from terminal cancer) is often a relatively asymptomatic disease. The union of the urinary and fecal streams will produce ascending infection and although the methods of Cordonnier and Nesbitt[13] are created to avoid such problems, nevertheless the problems are still present. Stricture formation at the site of the anastomosis of the ureter to the bowel is not uncommon. The patient must avoid hyperchloremia and acidosis by a low salt or salt-free diet and alkalizers. In addition, the problem of catheterization at periodic intervals during the day to avoid collection of urine in the rectum and thereby prevent absorption and also regurgitation is an inconvenient and hazardous procedure. Except when rapid and continuous run-off of urine occurs from a short segment, ureterosigmoidostomy should probably be abandoned.

3. *Isolated Segment of Cecum.*—The operation of Merricks and Gilchrist[7] creates an artificial bladder using the cecum and proximal end of the colon with the ileal-cecal valve maintained intact as a sphincter mechanism with the ostea leading to the abdominal wall. It can produce the problem of the cutaneous ureterostomy type of diversion with skin reactions to urine and cement, and also may or may not require an abdominal collecting mechanism, although the valve functions in many patients.

4. *Diversion to an Isolated Segment of ileum (Bricker Operation).*—This procedure also places an ostium on the patient's abdomen without control of the urinary stream subjecting the patient to appliances and skin reactions as well as the formation of large amounts of mucus, and/or calculi. Regurgitation to the upper urinary tracts is not totally absent and a constant source of infection is present.

Bricker[6] reported 118 pelvic exenteration and thirty-two other bladder substitution operations with an operative mortality of 3 per cent. Postoperative pyelonephritis occurred in 20 per cent. Normal upper tracts or minimal hydronephrosis was seen six months postoperatively in 86 per cent. Hyperchloremic acidosis was not observed. The operation fulfills in many respects an ideal operation for urinary diversion and bladder substitution: (1) Mechanical and technical simplicity make it practical to combine with major resection without staging. (2) Isolation of sigmoid from fecal stream decreases the chance of ascending infection. (3) The wide open external stoma with absence of sphincter mechanism decreases the chance of back pressure and reflux up the ureters. (4) Segments evacuate promptly through peristaltic action and are always relatively empty. (5) Mucosa-to-mucosa technique in performing ureteral intestinal anastomosis lowers the incidence of obstruction and thus of hydronephrosis and pyelonephritis. (6) The amount of absorption through intestinal mucosa is of no clinical significance.

5. *Diversion to the Proximal Colon.*—This procedure has been discarded after the demonstration by Boyce of the tremendous absorptive powers of the colon distal to the most proximal portion of the colon adjacent to the cecum.[14,15]

6. *Diversion to the Isolated Rectosigmoid with Diversion of the Fecal Stream by an Abdominal Colostomy.*—This procedure described by Kinman, Sauer, Huston and Mellick[16] demonstrated a definite absence of hyperchloremia or azotemia, and the control of the new urinary sphincter without incontinence of the urinary stream.

The essential features of this procedure are the permanent separation of the urinary and fecal streams, relative simplicity of execution and good functional results accomplished by construction of a diverting single-barrel colostomy at the junction of the descending and sigmoid colon and the use of the distal rectosigmoid colon as a bladder substitute to which the ureters are anastomosed. Patients are completely continent of urine during the day but slight incontinence at night is noted when overly tired. Incidence of acute pyelonephritis is less to none. Blood urea nitrogen levels remain normal. Daily irrigation of the colostomy allows control of bowel function and colostomy bags are not always necessary. Rectograms show surprisingly low pressure gradients and sharp peaks in each curve correspond with an urge to

empty the rectum so that such sensation should be adequate protection against excessive pressures within the bladder substitute. The surface of the colon exposed to urine is limited by the dimensions of the rectosigmoid bladder substitute.

Mauclaire[17], sixty-four years ago suggested this procedure and others have since advocated it (Kroenig,[2] Creevy[18]). Even today, the best series of ureterosigmoidostomy has 45 per cent incidence of hyperchloremic acidosis, therefore separation of the urinary from the fecal stream has been a logical step to take even though the goal of urinary or fecal continence must be abandoned.

Kinman et al[16] observed rectal defecation pressures of 180 cm. of water to as high as 280 cm. of water. The major portion of this pressure is due to the action of the diaphragm and abdominal muscles when the subject strains to defecate. This force is of course transmitted to the ureter as well as the bowel. Diversion of the colon by colostomy makes straining unnecessary. Secondly, fecal material is propelled to the rectum under some 80 cm. of pressure by peristaltic contractions extending along the entire length of the colon with alternate contraction and relaxation and shortening and elongation of one segment after another, progressively toward the anus. Colostomy blocks these progressive waves. Patients with a rectal bladder void at lower pressure relying largely on local bowel contraction for emptying, and also the need for abdominal straining is minimized because of the liquid content of the rectum. The voiding pressure in the isolated rectum will usually be less than 30 cm. of water.[12]

Acceptance of colostomy by surgeon and patient alike following radical operations on the rectum is well known. Colostomy should also be accepted as the means of avoiding many of the complications of ureteral-intestinal anastomosis. Ureteral-intestinal anastomosis has become a clinically less popular procedure, particularly when one considers the other methods of urinary diversion, ureterostomy, nephrostomy, and particularly the cecal bladder or ureterostomy *via* an isolated ileal loop. One is faced with two alternatives—a patient will have to choose between urinary incontinence from the stoma in the abdominal wall, collecting the urine by catheter or bag, or a colostomy which must be irrigated once a day. Even though feces are more repugnant to the patient than urine, with proper care a colostomy does provide a minimum of discomfort. We are not prepared to decide which arrangement will prove more acceptable and successful clinically, but the rectal bladder with sigmoidostomy offers a more physiological and practical substitute for the normal urinary bladder.

The urine has produced a minimal amount of reaction in the isolated rectosigmoid and although not ideally suited as a substitute bladder, yet the possibilities were explored as early as 1898 by Gersuny[1] as reported by Foges[2] in 1898 and 1899.

7. *Vesical Rectostomy.*—This procedure was first described by Maydl[19] in 1894 in which the trigone with the ureteral orifices intact was implanted into the anterior rectal wall. This had been done on numerous subsequent occasions by other authors. This procedure might be applicable to the patient with an exstrophy of the urinary bladder, or interstitial cystitis of intractable type, or severe bladder injury. However, for a carcinoma of the urinary bladder in which cystectomy is the procedure of choice, this could not be accomplished and achieve the primary purpose of attempting to eradicate the original pathology.

8. *Gersuny (Lowsley-Johnson) Operation.*—The thinking with regard to an answer which would most completely encompass and solve the problems of uretero-intestinal anastomosis lies in the Gersuny operation, diversion of the urine to the isolated rectosigmoid with diversion of fecal stream to the perineum avoiding abdominal colostomy.

Hinman and Weyrauch[2] in their review of ureterointestinal implantation described Gersuny's original procedure. Using the completely isolated rectum as a urinary reservoir, Gersuny in 1898 devised an operation intended to maintain fecal as well as urinary continence. He first isolated the rectum and implanted the trigone into the divided rectal lumen after Maydl's method. The proximal sigmoid was then drawn through an opening made along the anterior margin of the anus and anchored within the anal sphincter so that this structure could actively control both the newly-formed bladder and the sigmoid which served as the new rectum. Revising the location of the orifices in 1912, Bayer[2] attempted separate urinary and fecal outlets using a common rectal sphincter bringing the proximal bowel posterior to the new bladder. Melinkoff,[2] in 1924, modified

Gersuny's technique by fashioning the skin of the perineum into a channel intended to serve as a urethra for the newly-formed bladder and believed this channel opening at a distance from the anus minimized the danger of ascending infection. It was not revived until Lowsley and T. H. Johnson [3,4,5] reported a case of a fifty-nine-year-old man with carcinoma of the urinary bladder upon whom a Gersuny type procedure was performed. In 1955, T. H. Johnson[3] reported a two-year, nine-month period of use of the Gersuny Operation in two cases of carcinoma of the urinary bladder. In essence, the scheme of the operation is: (1) Anastomosis of the ureters to the isloated rectum through an abdominal incision. (2) Dissection of the sigmoid mesentery to liberate and lengthen the sigmoid. (3) Through a perineal incision immediately anterior to the anus, a plane of dissection is carried under the external sphincter ani muscle to the rectal-vesical pouch. (4) The liberated sigmoid is drawn under the external sphincter ani muscle and out the perineum. The final result is two perineal openings—separate but adjacent. The anus or urinary outlet immediately posterior to the perineal sigmoid stoma or new rectum, both orifices encircled by and under the voluntary control of the external sphincter muscle.

Stonington and Eisman[20] reported five cases of patients with carcinoma of the urinary bladder utilizing this procedure.

Keefer and Lienke[13] report four patients with exstrophy of the urinary bladder in which this procedure has been used avoiding the usual complications of the usual diversionary procedures.

Advantages.—

1. A separate orifice for the urinary stream with voluntary control.

2. A separate orifice for the fecal stream with voluntary control and sensation.

3. Possibility of avoiding regurgitation or reflux of urine to the upper urinary tracts.

4. Avoiding absorption of metabolites on the basis of the use of the most unresorptive portion of the intestine.

5. Avoidance of an abdominal orifice and collecting appliances.

6. A bladder which could be subject to cystoscopic examination if necessary.

The Gersuny Operation potentially will meet the three conditions for an ideal ureterosigmoidostomy: (1) control of the primary pathological process, (2) preservation of normal renal function, (3) continence of feces and urine provides the patient with two "natural" orifices not requiring collection appliances. Physiologically, approximately a normal voiding pattern with control and holding of the urinary stream is possible and the same situation can conceivably exist with regard to the fecal stream, with a normal filling sensation and emptying reflex. The location of both orifices in the male approximates that which is present in the female only with the orifices transposed.

Disadvantages.—The disadvantages will only become apparent when this operation has been done many times by various operators in various centers with the main problem that of possible renal damage. Separation of the fecal stream from the urinary stream should abolish any possibility of infection, for in the isolated rectal segment the urine should eventually be sterile and can be maintained in that state with proper perineal care by the patient. Absorption of metabolites with distortion of the electrolyte pattern is avoided by use of the least resorptive portion of the colon.

Possible Postoperative Complications.—

1. Leaking ureteral anastomosis—prevented by use of direct mucosa-to-mucosa technique under direct vision, and placement of splinting ureteral catheters through an indwelling rectal tube which is fixed to the peri-anal skin by heavy silk sutures.

2. Bowel herniating through the open triangle made by ureter, rectal wall and pelvic brim is a possibility.

3. Redundancy of tissue at the new rectum. Redundant tissue in the new rectum is purely a cosmetic disadvantage and it has been eliminated by Sherman's method of plastic reconstruction as a secondary procedure.

4. Formation of adhesions.

(To be concluded in June issue)

Psychodynamics of Hospitalizati

● An understanding, relatively non-technical discussion of the Psychodynamics of hospitalization and nursing care—and a common-sensical constructive criticism of current trends in hospital care.

THE MOST casual observation of a person suffering from a physical illness will usually reveal something about his outlook on illness. The psychosomatic approach to medicine considers psychic and somatic symptoms as different aspects of one and the same disease. This approach is based on the fact of the interrelatedness of body and mind so that whatever affects the one inevitably influences the other. The particular focus of this paper is closely, thought not strictly, linked with the psychosomatic approach to physical disease. It is an attempt to explore the psychic response of supposedly normal individuals to hospitalization, physical illness, and pain. One of the basic assumptions underlying a psychodynamic approach to physical illness and hospitalization is that normal adults frequently adopt regressive behavior patterns as a result of this new distressing situation. Although the aim of this paper is a deeper penetration into the psychodynamics of physical illness and hospitalization in adult life, a preliminary study of the child's response to sickness and hospitalization is practically indispensable for reasons which should become apparent as the discussion progresses.

It is necessary to know the complexity of the phenomena that we are exploring. That cause and effect relationships may be perceived more readily, a distinction between the effects caused by physical illness and pain and those caused by hospitalization will be made. However, it is equally important to realize that both are anxiety-producing factors: hospitalization because it separates the patient from loved ones and familiar surroundings, and physical disease because it may cause discomfort, inhibit movements, or be a threat to "ego" development.

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...ne Implications for Nursing

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Response of Children

The first anxiety-producing factor under consideration is the hospital experience. It is considered as a major source of anxiety because it separates the child from those he loves. Anna Freud refers to it as the "prototype of the first, short term separation from home."[1] The emotional response of a child to this situation is often referred to as separation-anxiety. Jessner and others found in studying 143 children, who had tonsillectomies and adenoidectomies, that the hospital experience had different meanings. Some experienced it as loneliness, others as a loss of protection and still others as total and complete abandonment.[2]

It is not unusual for the effects of a poorly handled hospitalization to produce in the child long-lasting separation anxiety which will definitely mark his personality development. Else Pappenheim and Mary Sweeney relate such an experience in describing Michael's first trip to the hospital to have his tonsils and adenoids removed.[3] Because Michael was only three years old his parents did not tell him anything about the hospital or about the operation; they thought that he would not understand anything anyway. They simply brought him to the hospital the morning of the operation and, after undressing Michael, his mother left him in order to take a message to her husband who was waiting outside in the car. When she returned she found that Michael was already gone, and she could hear his far-distant screams. After the operation, the hospital called the parents at home and told them that Michael was doing well and that they could come to get him the next morning. When Michael saw them the following morning he said, "You don't love me or else you would have come sooner." From this time on he was terrified when his mother left him, and the problem reached such proportions during his fourth year that it became necessary for him to receive psychiatric assistance. There were, of course, other factors which contributed to Michael's problem but the improper handling

of his hospitalization was certainly a significant one.

The separation problem in hospitalization of children may be intensified due to confinement. With the inhibition of movement there is additional frustration because the child can neither work off the excess energy caused by the anxiety-producing situation nor can he distract or express himself through play. One of the commonest ways for a child eighteen to thirty-six months old to protest separation from his mother is to plead for her return. (The encouraging thought for hospital personnel is that this wailing can not go on forever, for sooner or later another response will be initiated.[4])

There are additional problems resulting from hospitalization which should at least be identified in this discussion. For many children there are relationship problems because this may be the first time they have had a prolonged contact with anyone outside of their immediate family. There may be a new adult-child relationship with a nurse which may take the form of a substitute mother-child relationship. One thing is certain about these new relationships and this is that the child must live for a time with people who are strangers to him. If he is either an only child or a pre-school child, he may be confronted with a new form of social adjustment, that is, either forming new peer-relationships or being handled as one child among many other children. An older child's ego may be greatly threatened by being placed in a crib bed, particularly if he has some wishes to be a little child again. Regressive behavior patterns are frequently observed in hospitalized children. This regressive effect may be attributable either to hospitalization, to bodily illness, or to both. However, separation would appear to be one of the chief contributory elements, for the mother-child relationship directly influences the establishment of controlled behavior on the part of the child. He is able to face reality due to the support of the relationship with his mother. It is not at all unusual for a bowel-trained or bladder-trained child to lose this control within a hospitalization period and regress to a previous level of development, or for a weaned infant to return to bottle feedings. The regressed behavior always means that the child becomes more dependent on those in his surroundings and less self-sufficient.

Although the discussion of the effects resulting from hospitalization has not been an exhaustive one, we will now consider some of the psychological implications of pain and bodily illness on the life of the child.

It is believed that in infancy almost any tension, need, or frustration is experienced as pain. During the first few months an infant has practically no control of his response to stimulations either from without or from within, and excessive stimulations may be experienced as traumata.[1] Margaret Ribble points out that the infant's reaction to a primary tension state is predominantly a somatic or physiologic one, whereas in an adult the somatic aspect is not necessarily the chief component.[5] As the infant develops, pain becomes charged with a psychic meaning and the physiologic response is influenced or greatly determined by the mental interpretation of pain. Ordinary observation reveals that individuals have different levels of tolerance for pain. The analytic explanation for this fact is that the actual bodily experience of pain is not different but that the difference lies in the psychic significance attributed to pain. It is possible to observe the fact that bodily events begin to take on psychic meaning at at early age. For example, a child may be taken to a doctor's office for a blood count. The next time the child goes to the office for a treatment that is not painful, he reacts with identical distress. Another example is the response of distress that is experienced by many persons merely from the sound of a dentist's drill.

There are, in general, two behavior patterns which a sick child may adopt in meeting the physical demands of sickness. These responses have been referred to as changes in the distribution of psychic energy as a result of bodily illness. The first of these is a withdrawal from the external environment, a withdrawal which includes both things and people. The child loses interest in eating, playing, and talking to others. He is centering his energies on the inner world in which he is experiencing bodily distress. The second reaction is just the opposite of withdrawal; it is a behavioral response that makes greater demands on the external world. This reaction makes excessive demands on the affection and attention of others and wishes things to be used to alleviate interior distress. The dynamic explanation offered for this kind of reaction suggests a certain inability on the part of the individual to give his own body additional attention. As a child returns to his normal healthy state, the psychic energy be-

comes regulated once again, and while this is happening the child passes through a "cranky" phase.

Now the analytic interpretation of these two general responses to illness does not have to be accepted, but the observable behavioral patterns plus the disagreeable state in recovery are indubitable to anyone who has worked with sick children.

Changes in a child's emotional life during illness often result from changes in parental attitudes toward him. There is the ascetic parent who fears spoiling the child by giving him too much attention and who therefore resorts to leaving the sick child alone to "sleep out" his illness. There are many parents, the majority in fact, who become more indulgent during sickness than at any other time. They fondle the child, they drop disciplinary measures and give way to all requests. The mother spends more time with the child and, if he is a member of a large family, this may be a new experience for him. Being sick is for this youngster a rather pleasant experience.[1]

The experience of being nursed will also invite some changes in the child's emotional life. These changes can best be understood by reflecting upon the child's developing "ego." Ego development is understood in terms of mastery of bodily functions and the separation problem is slowly resolved as the child becomes more self-sufficient in caring for his own body. He is able to know himself, comprehend his own identity and know his own body apart from his mother's as he develops control over it and is able to care for it. A loss of control or even of independent caring for a part of bodily function is equivalent to a loss in ego development for the child. There is almost always a degree of regression present during a child's illness, for the most recent ego achievement is usually lost—inasmuch as a state of sickness is necessarily a more dependent one than that of health and forces the child to a preceding level of development. This can present a serious problem for a child who has built up resistance to a condition of passivity or for a child who has a strong leaning toward dependency and whose ego structure is very weak. This could be exemplified by the case of a child who had a baby brother born when he was one year old. This child was forced to become independent before he was emotionally ready for it. Since he still had infantile needs to be met, sickness afforded him the opportunity to be as dependent on his mother as he wanted to be—to be a baby again for a time.

The last point which we will consider is the psychodynamic aspect of surgical procedures. The chief concern here is the handling of the problem of fear of bodily injury. The psychoanalysts attribute a great deal of this to fear of castration. Anna Freud says that any operation "may serve as a focal point for activation, re-activation, grouping and rationalization of ideas of being attacked, overwhelmed (or) castrated."[1] The psychic significance is not in proportion to the seriousness of the procedure in reality but rather in relation to the phantasy about it. Jessner and others found in their study that the symbolic significance associated with tonsillectomy and adenoidectomy had been fostered by the parents of the children. For example, tonsils had been referred to as the focal point of "bad stuff" or as the source of all "difficulties." They also found other meanings, such as, giving birth, punishment, and exorcism.[2]

Adult Responses

The reflections that follow concerning some of the psychodynamic aspects of hospitalization, physical illness and pain pertaining to the normal adult are, for the most part, drawn from the preceding section on the child. The reason we have sought to approach the problem in this way is because most psychopathology in adult life is some form of regression to a child-like state. Now, it should, of course, be noted that we are dealing here with the presumably "normal" adult and not necessarily with a psychopathologic problem. But it is also imperative to consider and reflect on our observations that the normal adult under the stress of physical illness and pain and/or hospitalization frequently regresses to a preceding level of psychic development. Such a regression does not label him "psycho"; it simply implies that there is some psychological cause for his behavior. A mild degree of regression comes within normal range whereas exaggerated regression would, naturally, be abnormal. Although we do not consider this normal regression to be pathologic, it is necessary to turn to the field of psychiatry to gain an understanding of this process. Our approach from child to adult seems quite justifiable, for "logically any study of psychiatric disorders ought to put the child and his emotional illness first and then proceed to the study of disorders of later life where time, bringing added frustration, failure, disap-

pointment, infections, poisons, diseases and disintegration, has further complicated the problem."[6] By using this approach we move from a complex situation to a more complex one.

In discussing hospitalization for the adult, we shall follow the same plan used in the section on the child. The basic consideration will be similar, whereas the problem will be increasingly complex. The way in which an adult resolves his problems is dependent upon the way he resolved them as a child; he is influenced by a certain pattern which he established. If he has not established such a pattern and has therefore, a problem left unresolved from childhood, it will remain unresolved in adulthood.

Separation from parents was one of the principal problems of the child in hospitalization. By the time a person reaches adulthood it is supposed that separation from parents has been completed. This is not always the case; physically a person may be mature and independent, but emotionally he may be very immature. The mother figure represents security, well-being, protection and love to the child. As a child develops, his physical and emotional needs should be met simultaneously but this is not always so; hence, there may be a disproportion of development. Therefore, although physical separation may be complete, emotional separation may not be and may cause a person to feel insecure, frightened and unloved. Each time such a person is confronted with another separation he is overwhelmed with these feelings. If a hospitalization were poorly handled in childhood (as it was with Michael), a subsequent hospitalization will arouse all of the feelings of insecurity and helplessness which accompanied the first hospitalization.

In contrast to children, adults are better prepared to express their resentment of separation. Normally, an adult can talk about his feelings if he is consciously aware of this problem, whereas a child would have to use less mature symbols. Confinement for an adult is usually not as frustrating as it is for a child because an adult's energy is channeled and he is able to release emotion and energy through speech. Then, too, an adult is better prepared to cope with reality and to delay immediate satisfactions and pleasure in view of greater benefits. However, there are adults who find this very difficult. They are often resistive to social demands and controls (hospital regulations, et cetera).

The adult patient who is married usually suffers from marital rather than from maternal separation. If he is secure in marriage he will experience loneliness. If he is unhappy in his marriage and with his family responsibilities, he will feel a certain relief. If he is insecure in marriage, particularly in the love of his partner, hospitalization will cause him to worry excessively about his home. These problems are naturally intensified by prolonged hospitalization.

What does hospitalization mean to an adult patient? It may mean separation from loved ones, inability to continue with one's adult responsibilities in society, great economic loss, temporary loss of self-sufficiency. Depending upon one's previous associations with hospitals or attitudes acquired in childhood, it may signify death, birth, grief, hopelessness. These are only a few possibilities. The important thing to realize is that being hospitalized may mean something different for each patient.

Recently, I was on one of the nursing stations with a student who was to have an experience admitting a patient. The patient was a middle-aged Catholic woman, mother of three children who was to have a breast biopsy the following morning. When she was brought from the admission office, I stepped out of the nurses' station to receive her. I, of course, wanted to demonstrate to the student that the nurse should be warm and cordial in welcoming a patient so I said in the most gracious manner possible, "How do you do, Mrs. Brown. Welcome to St. Joseph's Hospital!" To which she responded with much feeling, "I can't think of any place I would rather *not* be. I just *hate* this place!" When we arrived at her room she looked at her husband and said, "Well, thank God, it is not one of the same rooms anyway!" She was one of the most tense and anxious women I have ever seen and I felt overwhelmed by the extremely strong feelings which she was directing at me, for at that moment I was personifying St. Joseph's Hospital. I asked what it was that she did not like about St. Joseph's. Then she told me that her mother died there of breast cancer and that her mother's two sisters had also died there of breast cancer. What St. Joseph's Hospital meant to her was apparent. Add to that the fact that the patient also had a breast tumor and her tenseness and anxiety became readily understandable.

New relationship problems arise for the hos-

pitalized adult. Later we will more adequately consider the nurse-patient relationship but here we will only allude to it for it is one of the central relationships within a hospital structure. Its dependency nature often results in a transference relationship; the patient transfers the feelings he had for his mother or mother figure, with whom he had his first dependency relationship, to his nurse. The nature of this transferred relationship will be dependent upon the nature of the original dependency relationship.

Another aspect of this relationship problem which may be disturbing for an adult is the change from caring for others to being cared for by others —the change from a role of activity to one of passivity. The staff in a hospital caring only for ill persons does not have the same indulgent attitude towards a sick person as do his family and friends. At home he is unique because of his illness but in the hospital he is one of many sick persons, and this difference in attitude toward him may constitute part of a relationship problem.

Regressive patterns of behavior which may be overtly discerned are numerous when one contrasts the behavior of any hospitalized person during his sickness with his normal healthy behavior. This is true because independence and self-sufficiency accompany the notion of maturity, whereas sickness naturally excludes these two notions and demands dependency and reliance on others.

Now let us turn to a few brief considerations of the effect of pain and bodily illness on an adult. We pointed out before that an infant has a low tolerance of tension and anxiety (pain) and that it has a diffuse reaction which is principally physiologic. Adults normally are able to tolerate tension or pain over a prolonged period of time and their reaction is channeled into certain bodily centers.

It might be well here to attempt to make a few distinctions. Fear is a reaction that is proportionate to an apparent danger, whereas anxiety is a reaction that is disproportionate to a hidden and subjective danger or even an imaginary one.[7] It is normal for a person to fear bodily pain and disease, but this must be in proportion to the cause. When an abnormal response arises one can be sure that anxiety is intermingled with the fear. (It is important not to confuse the precipitating event, if it be a sudden one, with the cause, as in the case of postpartum psychosis. Moreover, at this level of anxiety-reaction one is dealing with a psychoneurotic disorder rather than with a normal response.) A certain amount of anxiety is also normal because all persons have some unconscious motivations and suffer from nameless fears. When the cause of dread or anxiety is unconscious, it cannot be handled at a conscious level because the cause is not known. The physiologic response to fear prepares a person for fight or flight and results in an outpouring of adrenalin, and in an increased blood sugar. These same responses appear with anxiety but the person does not know what to fight, what to flee from, or even where to flee. He senses only his desire to run from, or protect himself from, his dreadful anxiety.

Now, the point to be grasped is that fear and anxiety increase muscular tension and distress in a person already suffering from a physical illness. The picture becomes complex and circular when, in addition to the thing feared, consciously or unconsciously, the very effects or response of fear and anxiety are also feared.

This brings us quite naturally into our next notion of the psychic significance of pain. We noted previously that the biologic meaning of pain is the same for all persons but that the psychic factors involved contribute toward the pain threshold. An understanding of this second component is necessary if we are to realize that pain, while it is an expression of distress and an asking for help, is not necessarily a symptom of mere bodily discomfort. Pain is a kind of communication of the whole person of man, body and mind; when made known to others, it becomes a plea for help. Szaz claims that the repeated complaint of pain is also a disguised aggression against the frustrating, rejecting authority which does not answer the person's plea for relief.

Pain is a subjective experience and is real only to the individual sufferer. The threshold level of pain, or attitude towards pain, reveals much about an individual person and can best be understood in view of the entire ego.

It should be pointed out that pain represents a dislocation of the ego-body relationship in a way similar to anxiety's representation of the disruption between the ego and the external world. Since pain and anxiety have a reciprocal influence on each other, one may be tremendously influenced by the other and anxiety may even be transformed into pain.

The two general effects of illness noted by Anna Freud in children are also observable in adults. The reaction to illness may be one of withdrawal in which the person loses interest in everything outside of himself and wishes to be left alone, or one of exteriorization in which the person demands attention and consideration of others and fears being left to himself. The recuperative phase is characterized by a general irritability in which the person is returning to a normal physical and emotional state. Adults may have more control over these feelings so that irritability may not be so apparent but, nonetheless, adults pass through this phase too.

The emotional life of an individual changes during physical illness. This is due to the changed attitudes in those about him, employer, wife or husband, or children. In general, a person is accepted during sickness for the person that he *is* rather than for what he *does*. The emotional state of sickness is generally one of receptivity and passivity rather than one of activity.

The experience of being nursed, which is usually characterized by passivity and dependence, also produces changes in one's emotional life. The more mature the person and secure in his adult state, the more he is capable of accepting temporarily this state of dependency. The less secure a person is, the more his ego is threatened by a dependency relationship comparable either to infancy or childhood. It has been said however, that even a "normal adult who is nursed through a severe illness cannot at the same time not feel that he is exposed to a series of indignities."[1] Being nursed implies a renouncing of ownership over one's body and a passive submitting of it into the hands of others. Other persons then assume responsibility for the body's most fundamental needs of cleanliness, clothing, urination, defecation; it will be fed by another, moved by another—in short, all that is most intimate to the care of one's personal body must be turned over to others. It is also worth noting that in sickness there is often complete or partial disregard of one's personal preferences, and the patient is subjected to orders, routines, and therapeutic measures.

In the preceding sections we have attempted to explore the psychological significance of hospitalization, physical illness and pain as it applies to both children and adults. This we realize was a very ambitious undertaking but it was felt that greater penetration into the problems of the adult could be achieved by first considering the child's response to the same problems.

Implications for Nursing

It seems quite obvious that these aspects of hospitalization and illness have many implications for nursing and the nursing profession. Although many applications could be made, I would like to suggest two which seem especially pertinent today.

Within the field of medicine attention is being focused on mental health. The National Institute of Mental Health is making grants available to selected schools of medicine and nursing for improvement in teaching psychiatric and mental health principles. The federal government supports such a program because it feels it is of the utmost importance and because psychiatric and mental health principles have admittedly been deficient in medical and nursing education in the past. These grants provide for greater emphasis on human relations content throughout the basic nursing curriculum and a greater understanding of the person who is ill and hospitalized. This simply means that a nurse is being prepared to give comprehensive care to patients; that she should be aware of social and emotional needs as well as of the physical and spiritual ones. This calls for the application of some basic principles. The following are only a few examples:

All behavior has meaning.—Consider the patient who always has his light on. He is communicating something to the nursing personnel and if they do not understand his behavior they will most certainly become impatient and intolerant.

All individual persons are different.—Some are naturally extroverts and others introverts; some are going to express their feelings and needs in a mature way, others will act them out in a less mature fashion. This calls for the application of still another principle.

Accepting a person as he is.—Let a patient be the person that he is and begin working with him at that level.

The hospital is an anxiety-producing situation.—Perhaps this principle is redundant here, but

if it is accepted, then the patient will be properly oriented to the physical surroundings, to the routine, and to what is going to happen to him. He ought even to be permitted to ask questions! These may seem like insignificant things but whether or not they are done means much to the patient.

The last implication for nursing has still to do with the nurse-patient relationship. There is a trend for patient care in hospitals to become very specialized. Many persons are applauding ideas like "progressive nursing care." I think this plan needs to be evaluated carefully and we should be made cognizant of its inherent dangers. Progressive care means that nursing units are set up according to the amount of nursing care a patient needs, but the only need considered, as far as I can determine, is the physical one. For example: A patient is going to have a gastric resection. The first unit that he is admitted to is the self-care unit where he has his work-up done prior to surgery. After this, he is sent to a second station which gives him his immediate pre-surgical preparation and then sends him to the operating room. After passing through the post-anesthesia recovery room he arrives at a third station where he receives intensive nursing care for several days. When the most critical postoperative phase has passed, he is sent to a fourth unit where he receives what is termed "intermediate" care. Finally, he is sent to a fifth nursing station, another self-care unit, for several days prior to his discharge.

Do you have a feeling from this description that we have just passed a car through an assembly line, that some indescribable and unknown object, called a human person, has just been moved from station to station to have a repair job done? What is wanting in such a situation? I have no doubt that such an organization of nursing units would be efficient and give excellent technical care to meet the physical needs of patients. But, the thing that is completely absent is any continuity of human relationships with hospital personnel. Under such an arrangement, the hospital takes on the appearance of the assembly line. If a man were merely an object, a thing, there would be no objection to passing "it" along so that "it" could be worked on, but because of the very nature of a man as a person, as a social being, "he" cannot be handled as an "it."

Perhaps this point needs emphasizing in our time. Because of the mechanized and technical world in which we live it seems extremely important that we put the person back into the right perspective. We live in an era that would often make us think that man is merely a consumer of producers' goods. The advertising industry would have us believe man is made to buy cars and TV sets; that it is not man that matters but the things man has made. Another related exaggeration of our times is what Dietrich Von Hildebrand calls "efficiency"—an efficiency which sacrifices all human warmth and personal involvement to the goddess of production and of schedules.[8] In such a kingdom all things and all persons must move according to schedule. Nursing has not escaped these influences. Wherever a nurse is simply concerned with "room 322" or with "the gall bladder" of Dr. Smith's, instead of with "Mr. Brown" —the thirty-three-year-old father of four children, who has a diseased gall bladder and is in room 322 —she is a victim of the depersonalization influences which are so characteristic of our era. It seems to me, that in our hospitals particularly, we must plan a counter-attack if the personal element is to be "preserved," or more precisely, "restored."

References

1. Freud, A.: The role of bodily illness in the mental life of children. *In* The Psychoanalytic Study of the Child. Vol. VII, p. 69. New York: International Universities Press, 1952.
2. Jessner, L., Bloom, G., and Waldfogel, S.: Emotional implications of tonsillectomy and adenoidectomy on children. *In* The Psychoanalytic Study of the Child. Vol. VII, pp. 126-168. New York: International Universities Press, 1952.
3. Papenheim, E., and Sweeney, M.: Separation anxiety in mother and child. *In* The Psychoanalytic Study of the Child. Vol. VII, pp. 95-113. New York: International Universities Press, 1952.
4. Bowlby, J., Robertson, J., and Rosenbluth, D.: A two-year-old goes to the Hospital. *In* The Psychoanalytic Study of the Child. Vol. VII, pp. 82-94. New York: International Universities Press, 1952.
5. Ribble, M.: Anxiety in infants and its disorganizing effects. *In* Modern Trends in Child Psychiatry, edited by Lewis and Pacella. pp. 11-25. New York: International Universities Press, 1945.
6. English, O. S., and Finch, S. M.: Introduction to Psychiatry. p. 101. New York: W. W. Norton and Co., Inc., 1954.
7. Horney, K.: The Neurotic Personality of Our Time. p. 42. New York: W. W. Norton and Co., Inc., 1937.
8. von Hildebrand, D.: The New Tower of Babel. Pp. 205-243. New York: P. J. Kenedy & Sons, 1953.

Editorials

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A CHOLESTEROL-LOWERING EXTRACT OF BRAIN

The cholesterol-lowering effect of an orally administered preparation extracted from brain, previously reported in animals and humans, has recently received a broad scale clinical trial at the University of Chicago Clinics.* Of seventy patients originally started on an emulsified form of the material, fifty cooperated in taking this emulsion for a period of at least three months. The serum cholesterol level during this three-month period was compared with that during a control period of comparable duration and encompassing several analyses in the same patient.

Statistical analysis of the difference between treatment and control levels was made in each individual case because of fluctuations in serum cholesterol sometimes correlated with an upper respiratory infection, emotional disturbance or other intercurrent illness. In the fifty patients reported upon, all but five had a fall in the mean serum cholesterol level with treatment and in twenty-seven the fall was statistically significant. In analyzing the data, it was found that the reduction in serum cholesterol effected by this agent showed a direct correlation with: (a) the initial height of the serum cholesterol prior to treatment and (b) the average daily dose of active material ingested. Nine patients with serum cholesterol levels over 250 mgm. per cent who took more than 25 gm. per day of active material showed a mean fall of 60 mgm. per cent (20 per cent) in cholesterol level. Patients who had previously been on a low fat diet showed a further reduction in serum cholesterol during the period of treatment with this material.

In six patients a period of treatment with the extract was compared with a period of treatment on beta-sitosterol (Cytellin) in approximately the same dosage of active material. The reduction in mean serum cholesterol level was quite comparable with these two agents. It is apparent that sitosterol and this brain extract will work more dramatically in patients who have an elevated serum cholesterol; in fact, will have no significant effect when the cholesterol level is normal. This is perhaps because the mode of action of this extract, like that of sitosterol, is based upon an interference with cholesterol absorption in the intestinal tract. Although about 40 per cent of these subjects complained of mild gastrointestinal disturbances, these did not necessitate discontinuing the emulsion in any patient who took it for more than one week. In two duodenal ulcer patients, however, symptoms were apparently aggravated by the ingestion of this agent.

The authors recognize that there is yet no proof that a modest reduction in serum cholesterol would definitely improve prognosis in coronary artery disease though indications are strong that such an accomplishment would serve this end. While serum cholesterol reduction can certainly be accomplished by a dietary restriction of fat, the superimposition of this agent could reduce the levels further. Whether a more severe dietary restriction or administration of this material, or some similar agent, will be more feasible for the long run is as yet an unsettled question. Either approach may be effective in properly selected individuals, but it is a frequent observation that patients on a dietary regimen of any severity tend to drift away from it in time, while they are much more likely to continue to perform a positive act, such as taking medicine, for prolonged periods. The difficulty remains that the benefit to be derived from any given extent of cholesterol reductions is impossible to assess in the individual patient, who will note, at best, no improvement in symptomatology due to atherosclerosis. In view of the unpredictable gain to the patient, the cost in time, effort and money is hard to justify except, perhaps, in those patients who present a frank hypercholesteremia (of greater than 300 mgm. per cent) where we do have reason to relate the coronary disease to the serum cholesterol level.

RICHARD J. JONES, M.D.

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THE FUNCTIONS OF A REFERENCE LIBRARY—I

I once read a little verse which begins—

"There are books to divert,
There are books to instruct,
There are books to excite, to arrest, to inspire. . ."

Books in all these categories will be found in any reference library, for libraries serve people, people with dissimilar interests, knowledge, and sensibilities, and must differ as people do; but usually the books and other publications in a reference library are those which can be used in some way to instruct, to answer questions. The reference library is a sort of information bank, a place in which information is deposited and organized, and then retrieved and dispensed when requested. It can cover the whole range of human knowledge and thought, as in the case of the Reference Department of the New York Public Library; or, at the other extreme, it can be limited to one subject such as art or labor relations. Even those with such subject limitations usually provide materials for research in their own specialty plus general information on other related subjects.

When we select the information to be included in a library we are defining the areas of knowledge in which it will have the greatest strength. If we are organizing a medical reference library we shall endeavor to discover what is being published in the fields of medicine that is reliable and accurate, and which medical men and women would find useful in some way. At this point compromises begin, as they always begin, with money. Usually there won't be enough money to buy all the publications which might be useful, and not enough employees to do all the necessary cataloguing and indexing, even if all such books, magazines, research bulletins, government documents, theses and miscellaneous pamphlets could be bought; even in the one broad area of medical knowledge.

We haven't mentioned the foreign language problem. Are we to collect all the Spanish, French, German, Italian, Danish, Dutch, Belgian, Norwegian, Russian, Swedish and Swiss publications that seem important? Medicine knows no language boundaries. Neither do education, engineering, metallurgy, geology, economics, chemistry, and physics; and such a list could be made quite long.

It was mentioned that only reliable and accurate publications would be selected for the library, implying the use of qualitative standards to evaluate unseen objects. Whose standards?

We have no specifications describing desirable weight, purity, fineness, moisture content, or anything else that can be measured. Selection must be a matter of judgment based upon knowledge, experience and personal values.

In a reference library a book should seldom stand alone, for books overlap each other, both in time and in subject matter. An important job of the librarian is to select those books which supplement one another in original form, those which form the basic literature as opposed to those which merely derive from that literature. Periodicals and documents must be used to supplement what can be found in the latest books.

Verification is an important function of a reference library to which the average person seldom gives thought. Errors are as ubiquitous in the library as elsewhere. The story is told that the famous "Boss" Kettering wanted a sign placed over the doorway to the library at the new General Motors Research Center. It was to read, "Beware, All Ye Who Enter Here."

How often the librarian reads in book reviews such statements as, "This is truly an outstanding book, however, on page . . . the author has made quite a serious error. . ." In another review, there will be a similar statement, and an error on another page will be noted. Yet, assuming that this book is important, it must be in the library. The librarian cannot mark such errors. He would not find all of them, and perhaps the reviewer is wrong. Obviously, also, if a book has been based on extensive research, and carefully written, it may be quite out of date by the time it is published, depending upon the state of research in that field of knowledge at that time. Such books must be purchased and become reference sources. The errors they contain may be not only preserved but disseminated.

If a person seeks information on a subject, borrows a book, and takes it home and reads it, he may believe that he is quite an authority on the subject. On the other hand, if he goes to a reference library and asks for information on that subject, he may be given many books and many periodicals to supplement the books. Almost invariably a different picture will develop in the reader's mind. He will be aware of differences of opinion, statements that seemed factual will now

seem dubious, and his feeling of confidence in his knowledge will have been tempered. He may feel less satisfied but he will be better informed.

RUSSELL F. BARNES, *Librarian*

SOCIAL SERVICE

Community Agency Participation in Medical Care

The citizens of Minnesota traditionally have exhibited a fine sense of social responsibility for people in need. This is a part of our pioneer heritage within our memory. Citizens in various communities throughout the state were concerned about people who needed medical care long before there were many organizations or agencies. The old medical charts contain letters from ministers, judges, county commissions, public officials and friends. Some of you will recall instances where local communities were greatly concerned about medical care for some patients.

The original reason for having legislation passed to make the county commissioner responsible for signing University Hospital papers was a wise one, as the county commissioner knew the people in his district. In those days the county commissioner often accepted responsibilities for helping patients when the hospital care was completed. He would ask the assistance of the people in his district to do many of the services now provided by agencies and organizations.

The Minnesota Children's Code passed in 1917 provided for Child Welfare Boards in each county. Yellow Medicine County was the first and within a short period of time most of the counties of the state had established such boards. They were made up of five citizens whose duties were to provide protective services for children. The social service department of the hospitals worked closely with these boards. In those days it was difficult for the department to locate community resources and there were instances where the social workers contacted as many as forty groups to complete the services the patient needed.

The passage of the Social Security Act in 1937 provided for a county welfare board in each county. Responsibility for major services to people of the community was delegated to a paid professional staff. These excellent agencies in every one of the eighty-seven counties give generously of their time and services to assist in carrying out the hospital staff's plan for patients.

For this year's discussion, we are presenting a patient situation illustrating the way in which community agencies and organizations participate in assisting the medical staff in its plans for patients.

ANNIE LAURIE BAKER

Community Participation in County and Township

Donald Matson is one of approximately 1,400 people who are receiving assistance or service from the Todd County Welfare Board. Being one of 1,400 would give the impression that it would be impossible for an agency with a staff of six professional workers to concentrate its efforts toward completely beneficial services for any given client. Quite to the contrary it has been the experience of the agency that it can give services and stimulate community action toward a goal.

Donald Matson, as one of 1,400, had no less rights or no greater rights than any other person of the 1,400. He was an individual who was younger than many others of the 1,400; he was an individual with a medical problem that could not be healed or cured as such; however, he was an individual who could be helped if things could begin to happen and people and organizations began to do things. Who were the people, the organizations, and what were the things? To state it simply, Donald was injured, severely injured. He was hospitalized and after a while he began to convalesce. The local hospital and his physician had done their part and it was Donald's physician who suggested the referral to the University of Minnesota Hospitals. He suggested this to Donald's parents and told them to contact the County Welfare Agency. At this point Donald became one of the 1,400; people and organizations began to do things.

Before proceeding with the case history, let us look at the Todd County Welfare Agency and its Board. The professional staff is six in number and it gives service to 1,400 people. The agency is the only organized social agency in the county. It has the administrative function of providing financial assistance to the aged, to dependent children, to the needy blind and to the disabled, and to persons in need of medical services at the University Hospitals. It has the responsibility to provide case work services to all clients receiving financial assistance and to provide these services either upon request or on its own initiative to people not re-

ceiving financial help with particular regard for minor children. Upon assignment, the social worker works directly with the client and his family under the direction of the supervisor and executive secretary who is, in turn, responsible to the county welfare board. I do not wish to portray the Todd County Welfare Board as typical or atypical. Its seven members meet twice monthly with the executive secretary on welfare board matters. Of the seven, five are county commissioners, who are elected officers in the county government. In Todd County, three of the county commissioners have full time farming operations, one is engaged in public relations work for a state-wide organization, and the other is a foreman of a construction crew. Two of the members are appointed by the Commissioner of Public Welfare. One is a farm housewife and the other a retired railroad conductor. The average tenure of the elected officers is about ten years and of the appointed members about six years. The welfare board is concerned not only with services to clients, but because it is an administrative board, it must be aware of the cost of these services and the probable benefits derived from the expenditure of the money. This board, non-professional, is the group that must act on the recommendations made by the staff.

At the time the request for assistance was made, what type of family had asked the help of the agency? Donald's father was fifty-eight, his mother forty-one. Donald was seventeen, a sophomore in high school. He had a twin brother and three other siblings ranging in age from eight to thirteen. The family had a low income, and the home conditions were none too good. Donald's father appeared to be a coarse individual with a "chip-on-his-shoulder" attitude. Donald's mother displayed an attitude of self-pity. At the time the social worker first talked to the family, the parents saw the University Hospitals as an extension of local hospitalization. There was no indication that the parents had any thought of their son's being able to help himself in the future. Donald's mother talked of her "poor son" who would never be able to care for himself. Without motivation from his family, who would be able to help Donald?

Upon referral, the county agency sought help and discussed with other public officials the use of other possible resources. The County Public Health Nurse, along with the County Welfare Board staff, felt that Donald might be rehabilitated. The Veterans Service officer (Donald's father was a veteran) was asked about the use of resources within his department. The use of the Mayo Clinic with the resources offered by the American Legion Child Welfare Fund was discarded because of the delay likely to be encountered. In conference with the local physician, the use of Gillette State Hospital was also discarded because of the lack of specialized services. The first ray of hope came after a referral to the Social Services Department of the University Hospitals. The agency was advised of the soon-to-be opened Department of Rehabilitation. A conference was held with the local physician who said Donald could return to his home to await admission to the Department of Rehabilitation. The agency arranged with a community organization, the American Legion Auxiliary, for the use of a wheel chair. At this point the second major community organization, The Village Council, was brought into the planning. The plan of rehabilitation had to be presented to this group's executive officer, the Village Recorder (who, incidentally, doubles as the Chief of Police). He was dubious but willing to listen. He questioned whether Donald would be able to live with his family after he had been rehabilitated. This first contact was inconclusive.

After Donald had been home for a week, he was returned to the local hospital. In the week that he was home, he was not removed from the wheel chair. His parents were afraid that they would hurt him and, as his mother explained, "anyway, we had no bed for him." Upon return to the local hospital, Donald was extremely discouraged and called the hospital a "prison." He wanted to go home, but he seemed to realize that it was "up to his mother" as to whether he could return home. Donald reached this low point a month after his referral to the welfare agency, but we must remember that he had been in the hospital for four months with the exception of one discouraging week at home. It was at this low point that the agency began to explain to Donald that they could arrange for him to be admitted to the Department of Rehabilitation. Because no admission date had been set, the agency had to proceed slowly to develop a motivation in Donald. They explained, too, the financial aid program, Aid to the Disabled, and how it could be a resource to Donald.

With this, planning moved ahead. The Village Recorder, apparently encouraged by the attitude Donald now held, said that the Village Council

would underwrite certain expenses if rehabilitation could be achieved and if the Aid to the Disabled program could be used as a resource after the period of rehabilitation. The agency began a planning phase that took into consideration Donald's return to the community. The County Public Health Nurse assured the agency that she was available to the parents on a consultative basis, which did much to help Donald's parents to understand that his injuries need not be totally disabling. The local school authorities said that they could plan a program for Donald and gave assurance of arrangements for physical care, if needed, when Donald was in school. The possibility of foster home care was touched on only briefly because of the parents' changing and improving attitude. This growth of motivation from Donald's parents continued. Just before his admission to the Department of Rehabilitation two months after the initial referral, the parents were hopeful that Donald would learn to walk again and that "he would stay (at the Department of Rehabilitation) if any good could be done." This attitude was a great change from the time when Donald's mother could speak only of her "poor son."

One of the first rehabilitation measures was the procurement of leg braces for Donald. The agency was requested by the Social Services Department to provide authorization for these appliances. To the agency, this meant its first request for financial assistance from the Village Council. The Village Recorder expressed doubt concerning approval from the Village Council because it had been asked to pay a bill for care at the local hospital for Donald. Donald's parents were hesitant about making a request for asistance from the village, and it became necessary for the local agency to go to the Matson home and assist in the completion of the request for assistance. Because of the expression of doubt on the part of the village recorder, several village council members were personally contacted. One of these members suggested that a house-to-house canvass for funds for the braces be made or that some community group be asked to pay for the braces. The agency naturally discouraged this because "this would not take care of a long range plan for Donald which is what we wanted at this time." The agency suggested that the council hold an immediate emergency meeting. This was held, and approval was given for purchase of the braces. This approval was given on condition that the agency worker appear before the village council to fully explain the proposed rehabilitation program. The village council was made aware of the actual economy of rehabilitation, which, if successful, would mean self-support or partial self-support. The community became aware of rehabilitation possibilities through the activity of the agency and the village council, and two service organizations—the American Legion and VFW held a benefit dance to raise a fund to be used when Donald returned to the community.

Planning for return continued; a local printing house showed a willingness to accept Donald for employment if he were properly trained, and the possibility of a study program at the local high school was again planned. These plans did not materialize, and Donald was placed for employment in Minneapolis.

An Aid to the Disabled grant was approved by the Todd County Welfare Board to supplement his earnings and the Hennepin County Welfare Board was asked to supervise Donald and prepare a monthly budget for him. The grant was based on need which includes all maintenance costs plus transportation to and from work. Because the latter cost fluctuated from month to month, it was necessary that the grant be changed in accordance.

At present, three agencies are working with Donald; The Todd County Welfare Board which provides the supplemental aid, the Hennepin County Welfare Board which makes the budget recommendation to the Todd County Welfare Board and the Social Services Department of the University Hospitals, which has the medical supervision of the case.

From the initiation of the case in July, 1954, to December, 1956, the total amount expended by the agency, the village council and the fund was $5,408.00. Of this total, University Hospitals costs were $3,469, and Aid to the Disabled grants were $606, the village spent $1,110 and the fund obtained by the benefit dance provided $223.

In order to assist Donald to obtain the medical care and rehabilitation he needed, eighteen social agencies in Todd County were involved, and ten agencies participated in the plans worked out by the local physician and the Todd County Welfare Board.

ANTHONY M. CREMERS

INFANT FEEDING—PROTEIN FACTOR

The normal full-term baby in the early months of life should have from 2 to 4 g. of high grade protein per kg. of body weight per day. If any official agency could define the requirement more precisely, it should be the Committee on Recommended Dietary Allowances operating under the Food and Nutrition Board of the National Research Council. In its official publication—National Research Council Publication 302, "Recommended Dietary Allowances" (1953), the Committee discusses the subject at length and reaches the conclusion that more convincing evidence is needed, before a specific recommendation can be made as to infant protein requirements or optimal allowances.

The Committee finds that breast-fed babies may receive as little as 2 g. protein per kg. per day, and that that may be sufficient. It also believes that in formula feeding, a level of 3.5 g. protein per kg. per day should better be prescribed.

The main difficulty in arriving at a conclusion as to what specific level of dietary protein is best for the baby lies in the fact that criteria for optimum growth and health have not been agreed upon. Babies receiving 3.5 to 4 g./kg./day of protein in a digestible form of cow's milk are found to retain more nitrogen, and to produce protein-containing tissue at a greater rate than their contemporaries fed human milk with its lower protein levels. Yet there are those who are reluctant to accept this as valid evidence of superiority in higher protein-level feeding. So, the search is on for other criteria of optimal infant health and progress that may possibly demonstrate that feeding protein at the lower levels found in human milk may produce better human beings in the long run.

Biological Values

The protein composite of cow's milk is higher in the casein fraction and lower in the "whey proteins"—lactalbumin and lactoglobulin—than human milk. This fact is no longer considered to be of importance in feeding the human baby. Differences in biological value of the protein composites show up only in feeding fur-bearing animals.

"Recommended Dietary Allowances" (NRC Publication No. 302) states, "The limited evidence available indicates that with improved processing techniques for increasing digestibility, the utilization of proteins from cow's milk is similar to that of the proteins from breast milk."

In Terms of Amino Acids

It is the amino acid moieties of the protein molecule that are of specific nutritional importance. Work is being done in at least two clinics to determine the minimum infant requirements for the essential amino acids. From measurements so far made, it appears here again that human milk carrying two to 2.5 g. protein/kg./day supplies no more than marginal amounts of certain of these amino acids, while the cow's-milk formula provides more nearly optimum amounts.

Protein Calories

There is another way in which the protein factor in infant feeding is often quantitated. In average human milk, protein calories represent less than 9 per cent of the total calories. The usual formula prepared from cow's milk with carbohydrate modification contains well over 15 per cent of total calories in the form of protein. Much that is known about the growth and composition of the human body and its various organs and tissues would suggest that the dietary patterns during the growing period should be more in the range of the latter than the former. Levels of dietary protein higher than that found in human milk have been shown to produce better growth in rats.

Some research projects are now on the planning board which may give us the answer to this rather puzzling question: Is the baby better off with the relatively lower protein intake supplied by breast feeding? Or, did nature make a mistake in failing to give modern mothers the ability to secrete a milk of higher protein content? Or, as the question was recently phrased by one of the principal investigators in the field of nitrogen balance, Dr. Stearns, "It leaves one wondering why the young infant has a capacity to utilize protein in amounts far beyond that which he could possibly obtain from his natural food."

Too Much Protein (?)

On the other end of the scale, the question is raised from time to time, as to whether it may be harmful to the baby to feed him protein at a level higher than that contained in human milk. The possibility of overloading his excretory capacity is argued. Some indications of a negative answer to this question are recounted above. There are others.

In recent years, there are an increasing number of proponents of infant feeding with cow's milk without the usual addition of carbohydrate. Such

satisfactory results have been observed that the non-carbohydrate feeding practice has been established as routine in many hospitals. And there are thousands of babies that have been so fed successfully. Such a formula gives a baby protein at the rate of 5 to 5.5 g. protein/kg./day. And here the protein calories represent fully 26 per cent of total calories. One must conclude that if the normal baby finds any difficulty in managing the higher level of protein in the cow's milk formula, such should be exhibited in non-carbohydrate feeding.

("Solute load," to a lesser extent from protein in the formula, more important possibly from the point of view of the higher electrolyte content of cow's milk, is also the subject of investigation in a number of clinical research centers. It also was the subject recently of a report from the Nutrition Committee of the Academy of Pediatrics.)

Protein Curd Tension

The behavior of the protein of cow's milk with respect to curd formation was long of concern in infant feeding. Medical literature these days hardly mentions the subject. As suggested in the NRC publication quoted above, and as has been stated many times in the literature of the past thirty years, the processing through which raw cow's milk passes in the preparation of evaporated milk has so altered the character of the casein fraction that it does not coagulate in a cheese-like mass in the infant stomach as does unheated cow's milk. The curd tension compares favorably with that of human milk.

Acidification of milk formulas originally had as one of its bases that of flocculating the curd before it enters the baby's gastrointestinal compartment. The increase in formula feeding with evaporated milk is one of the factors that has lessened interest in acidification. (Another argument for acidified formulas—that of safety in homes not provided with refrigeration—is still important in certain areas.)

Infant Disorders: Allergy

The involvements of protein in the feeding of other than normal babies cannot be treated in this short discussion. Our growing interest in world conditions has caused our U. S. medical and nutritional literature to be well preoccupied with reports on Kwashiorkor, prevalent in the technically underdeveloped countries, protein deficiency being a definite etiological factor. Attention being focused on mentally retarded children has directed attention to a congenital defect in metabolism, variously estimated at two to six per 100,000 births, which involves a disability properly to metabolize the amino acid, phenylalanine. The cereal protein, gliadin, is a metabolic stumbling block for some babies. A disturbance in protein anabolism is a causative factor in failure to produce gamma globulin. The importance of adequate protein levels in feeding prematures could be the subject of a review in itself.

There is one clinical manifestation, however, that should be discussed since it continues to be the subject currently of numerous reports in the medical literature. That is food allergy as it relates to milk protein.

Wide differences of opinion are being expressed as to the prevalence of milk protein allergy and its spectrum of symptoms. As many as fourteen behavior patterns have been listed as being caused by milk allergy, including general baby unhappiness! However, the proportion of the infant population definitely allergic to cow's-milk protein is reliably estimated as no more than 1 per cent.

The more soluble proteins of milk, lactalbumin and lactoglobulin, are the most likely culprits. Fortunately, they can be rendered relatively nonallergenic by heat, such as that to which milk is exposed in the production of evaporated milk. Allergenicity due to the casein fraction is less often observed. Unfortunately, exposure to heat does not effect denaturation of casein. In general, it is only in the small proportion of cases where the baby is intolerant to cow's milk casein that it is necessary to resort to synthetic milks made from meat or vegetable products, or from hydrolyzed proteins.

The high nutritive value of cow's milk in its various aspects would point to the importance of keeping the period of milk-free nutrition as short as possible, if and when withdrawal of milk is positively indicated. In this connection, Dr. Breslow recently offered the following diagnostic precaution: "Favorable results from the substitution of other products for cow's milk in the infant formula should not always be interpreted as indicating an allergy to milk protein."

Conclusion

From the evidence available at this time, one may conclude that modernly constructed feeding formulas prepared from evaporated milk provide

the normal baby with protein at desirable levels of intake, and of physical character appropriate to the infant's digestive capacity. The level is generous compared with that provided by average human milk. The conclusion is supportable that a generous allowance of protein in formula feeding provides a margin of safety that is compatible with good growth and maintenance of cellular tissue, and that it makes possible an accumulation of reasonable protein reserves which helps to provide adequate defenses against illness. There is no direct evidence that such a formula is too high in protein.

Whenever dietary allowances are considered, one must keep in mind that each individual inherits a characteristic metabolic pattern just as he inherits different patterns of body shape, size and coloring. Previous stresses to which the child has been exposed may cause variations in protein requirements. To the extent that the baby varies from the average, and particularly where the individual suffers a serious abnormality, metabolic or otherwise, competent medical management is clearly indicated.

FRANK E. RICE, PH.D.

ATYPICAL ENDOMETRIAL HYPERPLASIA IN THE YOUNG WOMAN

(Continued from Page 577)

References

1. Novak, E.: Relationship of endometrial hyperplasia and adenocarcinoma of uterine fundus. J.A.M.A., 154:217, 1954.
2. Novak, E., and Rutledge, F.: Atypical endometrial hyperplasia simulating adenocarcinoma. Am. J. Obst. & Gynec., 55:46, 1948.
3. Hertig, A. T., and Sommers, S. C.: Genesis of endometrial carcinoma. Cancer, 2:946, 1949.
4. Hertig, A. T., and Sommers, S. C.: Genesis of endometrial carcinoma. Cancer, 2:957, 1949.
5. Speert, H.: The premalignant phase of endometrial carcinoma. Cancer, 5:927, 1952.
6. Speert, H.: Carcinoma of the endometrium in young women. Surg., Gynec. & Obst., 88:332, 1949.
7. Faulkner, R.: Endometrial diagnosis. Am. J. Obst. & Gynec., 62:321, 1951.
8. Arfwedson, H., and Winblad, S.: Endometrial changes presumably premalignant. Acta Obst. et Gynec., 32:190, 1953.
9. TeLinde, R. W.: What are earliest endometrial changes to justify a diagnosis of endometrial cancer? Am. J. Obst. & Gynec., 66:953, 1953.

THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

STUDENT POSING AS DOCTOR GIVEN NINETY-DAY TERM IN ST. PAUL WORKHOUSE

On March 26, 1959 David L. Thompson, twenty-five, 847 Twenty-Fourth Ave. S.E., Minneapolis, a graduate student studying Industrial Relations Psychology at the University of Minnesota, was sentenced by the Hon. J. Jerome Plunkett, Judge of St. Paul Municipal Court, to serve a term of ninety days in the St. Paul Workhouse for the crime of assault in the third degree. On February 20, 1959, the defendant had entered a plea of guilty to the charge, which was placed against him after an investigation by officers of the St. Paul Police Department and a representative of the Minnesota State Board of Medical Examiners revealed that Thompson had been examining young women at a downtown St. Paul hotel under the guise of making pre-employment examinations for an Arizona corporation.

After receiving a telephone call on January 27, 1959, from the husband of one of the three women examined by Thompson, who had signed the hotel register as "Dr. Sperman" from Phoenix, Arizona, the investigators learned that during the preceding three days the defendant had called a number of women by picking names at random out of the St. Paul Telephone Directory. Thompson told these women that he was a representative of the Scandia Corporation of Phoenix and if they were out of work and wished to secure employment with the Scandia Corporation, it would be necessary for them to have a physical examination, inasmuch as this corporation was engaged in a business involving exposure to radiation by its employes. He added that the corporation was in the process of setting up a plant in St. Paul for the manufacture of x-ray equipment and therefore it was recruiting employes to staff the plant. When Thompson was arrested at the hotel, a number of medical instruments were found in his room including a stethoscope, speculum, opthalmoscope and a thermometer. He also had in his possession a deep-fryer, which he was using to sterilize the instruments, a pair of rubber gloves, test slides and a tube of lubricating jelly.

In a written statement given by Thompson, he claimed he was engaged in these activities in order to "obtain data on surprise reaction and gullibility" for the purpose of writing a thesis on this subject. In further attempting to explain his activities, Thompson stated: "During the interview I asked the girls about their home life, their parents, their interests, their lifetime goals, their activities, their problems and the people with whom they associate. I also misrepresented a questionnaire on medical history, asking them if they had sore throats, colds, painful menstrual periods, bloody or painful urination or bowel movements, headaches, frequent visitations to the doctor, whether they had even been turned down for a job due to physical handicaps or sickness, and whether they were concerned about the possibility of cancer. In attempting to do this, I hoped to gain an index of their reaction-apparent to such a ridiculous scheme. To me, the idea of a company sending a man from Arizona to interview girls and give them a physical exam was preposterous. These girls, in general, submitted to the physical exam and their reactions under such circumstances were noted. Therefore, I had an index of their reactions in a situation which placed them in an embarrassing position, assuming they believed I was qualified to give the examination. I also got an index of their gullibility and intended to attempt to correlate these indexes with the Bell Adjustment Inventory." The third-degree assault charge placed against Thompson was based upon his actual physical contact with the young women in using the various instruments enumerated above.

President's Letter

MORE ABOUT BLUE SHIELD

I hope every doctor in Minnesota reads the Blue Shield story written so very well by Dr. Olaf I. Sohlberg in the February, 1959 issue of MINNESOTA MEDICINE.

As Dr. Sohlberg stated, "There is so much misinformation and lack of information about Blue Shield that a few words might not be amiss. The basic principles are so simple and straightforward that when they are known, usually they are easily accepted and enthusiastically supported." Please read or reread the article.

It was my privilege and pleasure to attend the 1959 Blue Shield Professional Relations Conference held at the Drake Hotel in Chicago early in February. The discussions of professional relations which took place in the physicians groups centered largely around consideration of some of the basic policy factors affecting the establishment and maintenance of good professional relations.

First, the continuing need for effective communications was discussed. It was brought out that there is need to correct some of the widely held misconceptions concerning the Blue Shield program; to define the range of community need the Blue Shield program can be expected to serve; to create understanding of the basic purposes health care should cover; help to meet the socio-economic problems confronting medicine and to keep physicians informed about current developments.

Second, the plans must remain closely allied with their sponsoring medical societies, and liaison groups should be established so that the medical society and the plan may work together in finding solutions to problems of mutual concern.

Third, in the matter of fees, Blue Shield must not place itself in the position of establishing fees for any segment of medicine. This is a matter of medical policy and should be resolved within the state or county medical societies. In all matters involving medical policy and ethics, the sole arbiter must be the medical society.

Fourth, there was a discussion of the problem of overuse and its effect on professional relations—a problem in preserving the fiscal soundness of Blue Shield. It was suggested that in the problem of utilization, plans should approach their solution through appropriate channels of the state or county medical societies. Blue Shield cannot succeed without the wholehearted support of the medical profession.

There was considerable discussion concerning the AMA resolution to promote the financing of the health care of the aged. It was agreed that both the health insurance industry and the prepayment plans can apply their particular resources to the implementation of the resolution. Minnesota Blue Shield and the council of the Minnesota State Medical Association have had several meetings, and it is hoped there will be a plan for presentation to our House of Delegates' meeting in Duluth.

A report published by the Health Information Foundation best illustrates the attitude of the actuarial committee in facing this problem.

"It is interesting to note that, *without a major federal program of health insurance,* there is little difference these days in the volume of medical care received by people in widely separated income groups. Clearly, medical care is generally available to the public regardless of ability to pay." That meant that our American society has accepted the philosophy that no person should be denied necessary health care for financial reasons. We must decide how best to keep our system voluntary.

Benjamin B. Foulston M.D.

President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

UNIONIZATION OF HOSPITAL EMPLOYES IN MINNESOTA MAY SET NATIONAL PATTERN

The eyes of the nation are focused upon Minnesota. Apprehensive hospital administrators, vendors of health care plans, as well as the general public are observing organized labor's success in unionizing hospital employes in the Minneapolis-St. Paul area.

In the April 2, 1959, edition of the *Wall Street Journal,* the Minneapolis-St. Paul, San Francisco-Oakland, California, areas were listed as two significant concentrations of organized hospital employes.

Observers are not discounting the possibility of another boost in the already spiraling cost of medical care should the trend continue to grow throughout the country. Because the trend could significantly affect the future cost of medical care, the following article in the *Wall Street Journal* is directed to the attention of all members of the Minnesota State Medical Association:

A drive by labor unions to organize hospital employes is picking up speed in New York City and now threatens to spread across the country.

The campaign, if successful, almost certainly will worsen the already desperate financial plight of the nation's voluntary, non-profit hospitals, many of which are tacking up record operating deficits despite steady increases in room rates and service charges. Broad-scale unionization of hospitals also would tend to boost still further the hospital fees patients pay and the premiums charged by Blue Cross and other health insurance organizations.

"If the unions were to organize us, there wouldn't be a request for a measly 20 to 30 per cent increase in Blue Cross premiums—the premiums would have to be doubled," warns Dr. Henry Pratt, director of Manhattan's massive 1,431-bed New York Hospital, where the muscular International Brotherhood of Teamsters now is attempting to organize the institution's 2,700 non-professional employes.

Three Unions Compete

The Teamsters' organizing campaign in New York is being led by Henry Feinstein, president of Local 237, who earlier this year achieved brief fame when he started a drive, later abandoned, to organize New York's police. However, Mr. Feinstein's union is not alone in this new venture—the Retail Drug Employes Union, Local 1199 (affiliated with the 250,000-member Retail, Wholesale and Department Store Union of the A.F.L.-C.I.O.) and Local 302 of the American Federation of State, County and Municipal Employes, A.F.L.-C.I.O., also are trying to sign up the more than 30,000 non-professional workers in the city's 79 non-profit hospitals.

Meanwhile, in Florida, Teamsters' Local 237 there has launched a drive to organize the non-technical employes of county hospitals in Miami. The immediate targets are Jackson Memorial Hospital, with about 2,500 workers, and Kendall Hospital, with 250. After this campaign, the union will try to organize Miami's private hospitals, according to William Huet, business agent of the local.

As yet, the Teamsters have no nationally coordinated organizing drive on hospitals in the works, states Jimmy Hoffa, president of the union. Instead, he said, each local situation will be studied and if the prospects are favorable for organization, the International will give its approval to the local to go ahead.

Mr. Hoffa says that, although he okayed the New York drive, he has turned down repeated requests to organize Detroit's hospitals on the grounds that the climate of public opinion there is not ready yet. But in time, Mr. Hoffa says, he expects the public attitude in the nation as a whole to grow more favorable to hospital unionization and then, he adds, hospital drives might be undertaken on a broader scale by the Teamsters. Success in organizing New York's hospitals, of course, could well encourage the union to undertake such broader-scale drives.

At Stake: 1.4 Million Workers

At stake in these parallel national organizing efforts is a labor group, now largely unorganized that is bigger than any present national union—the Steelworkers, Auto Workers or even the Teamsters, themselves. There are now more than 1.4 million persons employed by the nation's 6,800 hospitals, according to the American Hospital Association. Of these, 700,000 work in voluntary, non-profit institutions, roughly 450,000 are employed in city, state and county hospitals, and the remainder in Federal institutions and private hospitals that operate for profit.

So far, only in the Minneapolis-St. Paul and San Francisco-Oakland areas is there much of a concentration of unionized hospitals. Significantly, the daily room charges and Blue Cross premiums in both of these localities have now risen far above those in New York City, where only two of the city's 81 voluntary hospitals so far recognize unions as bargaining agents for their employes.

In New York City, meanwhile, the situation is fast coming to a head. Picket lines have been thrown up around some of the hospitals. Workers at five hospitals who have been signed up by Drug Workers Local 1199 have already voted to strike, if they are not granted recognition. Attorneys for the various hospitals, it is admitted privately, already have drawn petitions for anti-strike injunctions to be rushed to court the minute their workers walk out.

"A Matter of Life or Death"

"If they should stop truck deliveries to a hospital, it could become literally a matter of life or death," says one New York hospital director.

Two such incidents already have generated considerable ill will between hospital administrators and the unions and even among the unions themselves. At New York Hospital, ten Teamster truck drivers refused to cross picket lines recently—with the result that surgical instruments, glassware, plumbing fixtures and other hospital supplies went undelivered. At Presbyterian Hospital a truck loaded with oxygen also refused to cross a picket line.

The incidents were publicly deplored by Leon Davis, president of Local 1199 of the Drug Workers, who charged that such Teamster tactics "will play into the hands of hospital managements so they may accuse all unions of being irresponsible."

Teamster Feinstein's comments on the supply tie-ups are hardly reassuring to the hospitals. He says that while he has not ordered any stoppage of deliveries so far, on the ground that there is no strike yet, "truck drivers are free to decide for themselves if they want to cross a Teamsters' picket line."

"Evacuate the Patients"

If the union does call a strike, says Mr. Feinstein, "we'll ask the hospital to evacuate the patients. We don't want to be put in the position of causing anybody's death. The hospital will have sufficient time to take the patients out." Any Teamster strike of hospitals would require the approval of the union's Joint Council in New York and also of the international union, headquartered in Washington.

In the three-cornered race to unionize New York's hospitals, Local 1199 of the Drug Workers seems to be out in front, claiming it has signed up a majority of the workers at twelve hospitals in the city. The other two unions, however, have reached "an informal understanding" and recently the Teamsters even went so far as to send pickets to help out at Presbyterian Hospital where the municipal workers union is concentrating most of its efforts.

Officials of all three unions say their organizing efforts are aimed solely at raising wages of hospital non-professional workers, which they claim are among the lowest in the nation. They charge that pay for orderlies, porters, dietary workers, nurses' aides and other non-professionals ranges roughly between $34 to $40 a week in New York's non-profit hospitals. Workers in the city's municipal hospitals, on the other hand, start off at a minimum of $53 a week.

As charitable, non-profit institutions, the hospitals are exempt from the minimum wage, disability and unemployment insurance laws.

Ascending Deficits

"We don't deny that we pay a low wage," says Joseph Terenzio, the tense, dark-haired young executive director of Knickerbocker Hospital. "We want to pay higher wages but we are paying as much as we can right now." He points to a chart sketching in red ink more than five years of ascending deficits. "What do these unions expect us to do, open up a trap door in the floor and pull out a big bag of money?"

Dr. I. Magelaner, executive director of Jewish Hospital of Brooklyn, says flatly: "Wage increases cannot be given when the money does not exist."

There is no question that many hospital employes (about 80 per cent of them here are Negroes and Puerto Ricans) are disgruntled and in favor of anything that would raise their wages. "I'm barely able to pull along, and only because I get help from my mother," says 21-year-old Alvin Phillips, an orderly at Manhattan's Beth Israel Hospital, who makes $35 a week.

John Carr, a wall washer at Jewish Hospital in Brooklyn, declares angrily, "I'm ready to strike right now, if possible. My take-home pay is $78.99 every two weeks and I have to borrow money from one payday to the next."

Handicapping the union drive is the fact that neither the National Labor Relations Act nor the state labor law requires non-profit hospitals to recognize or bargain with unions. Each hospital is free to follow its own course of action. So far, most of the hospitals have taken the position that they will not deal with the unions in any way.

Fears of Interference

This stand apparently is based on hospital administrators' contentions that the unions, if recognized, would interfere with the care of patients.

"Everyone in a hospital, from the janitor to the head nurse, has one purpose, the care of patients," argues New York Hospital's Dr. Pratt in a calm, patient voice. "We do not want a third party—a union or anyone else without responsibility—to stand between the patient and the people who are charged with his care."

Unions, some other hospital officials speculate, might want to set up hiring halls where union officials could determine who goes to work in a hospital—or unions might want to have a firm say about whether an employe should or should not be fired.

However, the main ground for opposition to the union drive undoubtedly is financial. Hospital leaders in New York like to point to Minneapolis as an example of what might happen if union demands are granted.

Costs per patient per day, at hospitals where Local 113 of the Building Service Employes Union has obtained a contract, are estimated at $38 to $40, compared with the $27 to $35 in New York City. In Minneapolis, orderlies earn $250 a month to start and $266 after two years. Unskilled workmen such as dishwashers earn $235 monthly and $251 after two years. A hospital official in Minneapolis figures this is $60 to $80 a month more than in non-union hospitals in "comparable cities."

Costs of Coverage

The impact is equally pronounced in Blue Cross rates in Minneapolis. An official of Swedish Hospital there reports, "Our Blue Cross full family group contract is around $10 a month, probably the highest for comparable coverage in the nation." In New York, it is $5.34 and roughly comparable plans cost $9 monthly in Denver, $5.75 in Durham, N. C., and $9.55 in Fargo, N. D., according to other hospital officials. (Blue Cross' health coverage is handled by twenty-five different regional member associations; benefits offered by these associations often vary slightly so premium comparisons are not completely indicative of the respective costs of coverage).

Similarly, in the San Francisco-Oakland area about twenty-three hospitals with a work force of 2,900 employes are unionized. The average inpatient cost is slightly over $40 a day per patient, according to W. J. Kramer, executive secretary of the San Francisco Hospital Conference. He says costs have been rising 4 to 5 per cent a year and he expects them to go up another 4 per cent by 1960. However, Mr. Kramer believes the steady wage increases there are not due so much to unionization as to San Francisco's "generally high wage levels." Hospital wages there start at $58.90 a week for the lowest-scaled employes.

Wage levels comparable to these would have an immediate effect on New York's already deficit-ridden hospitals. Last year, for example, New York Hospital had an operating deficit of more than $1 million. Knickerbocker Hospital with operating costs of $2 million a year, went into the red by $156,000.

To get cash to cover the deficits, New York hospitals are having to borrow from the principal of their endowment funds, which generally have no restrictions on their use, in addition to using interest on their endowment funds and soliciting contributions from the public.

They also are pushing hard to get a 20 per cent boost in the amount the local Blue Cross plan pays the New York hospitals. This figure now amounts to $26 a day for a patient with Blue Cross coverage.

Blue Cross itself is running into serious money

troubles. Last year, New York's plan, known officially as the Associated Hospital Service of New York, asked state authorities for a 40 per cent increase in premiums to cover mounting losses. The state, after hearing strong complaints from consumer groups and some labor unions, trimmed the allowable premium increase to 22 per cent. The result, according to Blue Cross officials, was a deficit of more than $20 million in the Association's operations. The Association has indicated it will appeal again to the state for a higher premium very shortly.

Because of the swift spread of Blue Cross in recent years, hospitals have become increasingly dependent upon its payments. "About 40 per cent of our in-patients income is from Blue Cross," says Dr. Pratt of New York Hospital.

Public-Charge Patients

Most non-profit hospitals also are charity institutions, with indigent patients taking up a large share of the beds. In New York, the city pays $16 a day to the hospitals to handle these public-charge patients. But this falls far short of actual costs, say the administrators. New York City has promised to boost these payments to $20 a day in July and to make additional $1 and $2 yearly increases in the future.

With so much of their income controlled by the city governments and Blue Cross, hospitals say that a mere increase in their charges to private patients who are able to pay hospital bills will not be enough to solve their problems. "We raised our rates an average of 10 per cent last year and got only an additional $10,000 income," says an official of Knickerbocker Hospital.

FASTER MEDICARE BILLINGS ASKED

Medicare officials have expressed concern over the increasing number of delayed billings submitted under the Medicare program.

The office of the Surgeon General, United States Army, in a special bulletin, has presented the following information with regard to the submitting of claims

Delay in Medicare Billings—This office is concerned about the receipt of a large number of claims which have been delayed for a considerable period of time after completion of care. Delayed billings cause many problems for the Government, the contractors, the dependent or sponsor, and the source of care, all of whom are interested in settling the matter of payment as soon as practicable. From the Government's standpoint, the timely receipt of claims is most important in that the information therefrom is used as the basis for budgetary requests and other required statistical data.

Future Claims.—It is emphasized that Medicare contracts call for payment to be made on the basis of "complete" claims. Hospitals and physicians are urged to obtain all of the necessary information, including the Medicare Permit if required, or make arrangements for obtaining same, at the time the patient makes the initial visit and at the time the understanding is reached that care will be rendered under the Medicare Program. It is particularly important to examine the DD Form 1173 (Uniformed Services Identification and Privilege Card) and to obtain and record the required information therefrom, or to obtain adequate documentation establishing that the patient is an eligible dependent of an active duty member of the Uniformed Services. Physicians and hospitals are urged to submit claims as soon as care has been terminated. This will assist in cutting down correspondence required to complete the information necessary on the Claim Form for payment. With the passage of time, records may be misplaced and difficulty experienced in assembling all of the information required to submit a "complete" claim. Also, with the passage of time, the serviceman may be discharged or reassigned and he and the dependent may leave the area where care was received. In some cases, difficulty is encountered by the Uniformed Services in contacting the reassigned member or a former serviceman and his dependents after discharge.

Old Claims.—For the same reasons outlined above, physicians and hospitals are urged to "complete" and submit old claims, on hand, as soon as practicable. With the passage of time, it will become more and more difficult to process these claims and resolve difficulties which may arise in connection with them.

KEOGH-SIMPSON PASSES HOUSE

House passage of the Keogh-Simpson Bill (formerly the Jenkins-Keogh Bill) may be noted as another forward step designed to give major tax relief to doctors, lawyers and other self-employed persons.

Passage would allow such persons to deduct from taxable income, up to 10 per cent of self-employment earnings, up to a maximum of $2,500 a year, provided they put the money in certain specified types of retirement plans. This deduction could be taken for up to twenty years making a lifetime deduction of $50,000.

According to the provisions of the bill, sponsored by Representative Eugene J. Keogh (D., N. Y.), tax would not be paid on this income in the year it was earned, but only later when the individual retired and began drawing out money from the retirement fund. At that time, of course, he would in all likelihood be in a much lower tax bracket. Persons who are over fifty when the bill becomes law could defer taxes on considerably more than the $2,500 limit each year. The taxpayer could take the money back before retirement only on the payment of penalty taxes.

The program, opposed by the administration, passed the House last year, but Senate Finance Committee Chairman Harry F. Byrd (D., Va.) delayed consideration of the measure in the closing hours of the 85th Congress. Similar delaying tactics may be expected of Senator Byrd at this time. Proponents of Keogh-Simpson are hopeful that there may be forced action on the measure late this session or next year. The possibility of a presidential veto cannot be discounted.

Administration opposition is based on the theory that a $3 billion revenue loss will be experienced by the treasury. In addition, the treasury contends that the greatest benefits of the measure would be in favor of high income bracket individuals.

Members of the association and its auxiliaries are urged to write or wire Minnesota senators urging their support to H.R. 10. Address communications to Senator Hubert Humphrey and Senator Eugene McCarthy, (a member of Senator Byrd's committee), Senate Office Building, Washington 25, D.C.

MEDICINE AND THIRD PARTIES

Medicine recently has been much concerned by what is called "third parties." A third party has been defined as any mechanism which enters into the relationship between patient and physician.

The American Medical Association has not opposed these third parties as such, but it has expressed concern that an adverse effect on the selection of physicians, their compensation, and the quality of medical care rendered might occur because of the third parties' methods of operation and financial interest.

While the medical profession has been striving to attain full acceptance of the fundamental principle of the individual's right to choose his own physician, certain third parties in recent years have moved in the opposite direction. They arbitrarily select physicians for their members and require the members to use their services exclusively or pay for the services of another physician.

The abridgement of the patient's freedom of choice often occurs because of the third party's special interests. Likewise, methods of compensation other than fee-for-service, establishment of inequitable professional standards, and limitation of diagnostic and treatment services may be stimulated because of fiscal considerations rather than the needs of the patient or physician. In some plans promotional techniques may be developed that conflict sharply with traditional ethical methods for establishing a medical practice.

The interests of the patient and his medical care must come first. The patient must not be a pawn or captive or a third party. He should be free to select his own physician because that choice, in my opinion, is essential to the provision of the best medical care. Certainly experience has taught us that free choice generally establishes the confidence of the patient in his physician, a vital factor in successful therapy.

If Medicine abandons its historic support of the principle of free choice, it can expect increasing third party interference in decisions on predominantly professional matters.

The number of third parties is growing; the number of persons they serve is increasing. Unless medicine soon contains the influence of third parties on medical practice, it can expect the worst.

However, I believe that we can prevent the extension of third party influence by adhering uncompromisingly to the basic principle of free choice, by rendering competent medical care at a cost which patients can afford, by assuring the public of the competence of licensed physicians, and by policing our ranks to eliminate professional incompetence or economic abuses.

These must be self-imposed responsibilities that must be discharged vigorously now and in the future or Medicine may well find itself completely subservient to the third party!

—GUNNAR GUNDERSON, M.D.
President, AMA

Public Health

POLIO PROTECTION STEP-UP URGED BY MINNESOTA DEPARTMENT OF HEALTH

Minnesota had a light poliomyelitis year in 1958. Only twenty-five cases with one death were reported to the Minnesota Department of Health; twenty-three cases were paralytic.

Although Minnesota experienced its fewest number of polio cases in eleven years, polio epidemics are still possible unless a much greater proportion of the population is protected by vaccine, according to Dr. D. S. Fleming, director, division of disease prevention and control.

While it is difficult to say how much of the decline in cases since 1955 is due to immunization, Dr. Fleming points out that the Salk vaccine is the only proven, effective protection available to the public. He urges all unvaccinated persons to begin the full course of polio shots now.

He suggests that local antipolio campaigns be organized at once to see that vaccination programs are as effective this year as they were in 1957 when the Salk vaccine first became available. A nationwide program to stimulate local action has the support of national, state and local medical, public health, and voluntary agencies. Physicians are urged to make certain that all families they serve receive full benefit of the vaccine.

Whether immunizations are given in the physician's office, in school, or community programs should be determined by local physicians and the community. Even if everyone who is susceptible were vaccinated, one-fifth of the population would be subject to paralytic polio since the vaccine is only 80 per cent effective, according to Dr. Fleming.

A total of 4,620,438 cc. of polio vaccine had been shipped to Minnesota as of December 12, 1958, since the program got underway in 1955. Of all vaccine shipped into the state, 63 per cent has been from commercial sources; 32 per cent was federally subsidized in 1955-56; and 5 per cent was furnished by the National Foundation in 1955.

Physicians were required to report the use of federal vaccine, but the reporting of the use of commercial vaccine has been on an entirely voluntary basis. Even so, as of December 31, 1958, physicians had reported 2,852,125 inoculations, including 1,292,506 inoculations with commercial vaccine. This represents 44 per cent of all commercial vaccine that had been shipped into the state.

The 1,292,506 reported inoculations with commercial vaccine includes 392,484 first shots; 353,404 second shots; 540,189 third doses; and 6,429 fourth doses. All fourth shots were given in 1958.

Emphasis must continue to be on immunizing infants and youngsters, according to Dr. Fleming. Since the introduction of Salk vaccine, the highest rates of paralytic polio have occurred in children under five years of age. Of the estimated 384,631 children in the infancy to four-year age group, only 38 per cent have had three shots.

The second highest rates of paralytic polio per 100,000 population have occurred in children five to nine years of age. Of the 297,982 children in this age group, the state health department estimates that approximately 49 per cent have had three inoculations, based on reported shots.

Immunization of persons ten years of age or older has also lagged. About 32 per cent of youngsters ten to fourteen years of age have had three doses; approximately 19 per cent of youths fifteen to nineteen years of age; 13 per cent of persons in the twenty to thirty-five age group, which includes parents of young children and pregnant women; and 2 per cent of persons over thirty-five years of age.

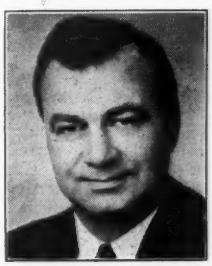
Dr. Fleming points out that although first and second shots give protection, greatest antibody level is established only after the third shot. "Protection is not only greater; it is longer lasting," he states. Dr. Fleming urges a continuous immunization program against poliomyelitis.

Minnesota State Medical Association

106th Annual Meeting

Duluth, Minnesota—May 25-27, 1959

Guest Speakers



ROBERT J. ANDERSON, M.D.

Atlanta, Georgia

"Animal Diseases Transmissible to Man" will be the title of the presentation which will be given by Robert J. Anderson, M.D., Wednesday, May 27 at 11:00 a.m. Dr. Anderson is Assistant Surgeon General and Chief, Communicable Disease Center, Public Health Service, Department of Health, Education and Welfare.



ELEXIOUS T. BELL, M.D.

Minneapolis, Minnesota

Elexious T. Bell, M.D., will present the Arthur H. Sanford Lecture in Clinical Pathology, Tuesday, May 26 at 11:30 a.m. "A Clinical and Pathological Comparison of Chronic Glomerulonephritis and Malignant Hypertension," is the title of Dr. Bell's presentation. Dr. Bell is Professor Emeritus, Department of Pathology, University of Minnesota. His appearance is sponsored by the Minnesota Society of Clinical Pathologists.

HERALD R. COX, Sc.D.

Pearl River, New York



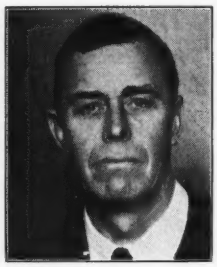
Herald R. Cox, Sc.D., Director of Viral and Rickettsial Research, Lederle Laboratories, will participate in an "Oral Polio Vaccine" round table luncheon, Wednesday, May 27 at 12:15 p.m. In 1945, Dr. Cox was awarded the United States of America Typhus Commission Medal by the Secretary of War for his development of epidemic typhus vaccine, known as Cox-type or yolk-sac vaccine, which was adopted by the United States Army and Allied governments for immunization of military personnel against epidemic typhus fever. Dr. Cox's special fields of interest are the investigation of human and animal diseases of viral and rickettsial origin; the chemotherapy of viral and rickettsial agents; chemotherapy and viral antagonism of carcinogenic agents; and the chemistry of peptides and polypeptides.



JAMES W. CULBERTSON, M.D.

Memphis, Tennessee

James W. Culbertson, M.D., Professor of Medicine, College of Medicine, University of Tennessee, will participate in the opening panel discussion of the 106th Annual Meeting of the Minnesota State Medical Association, Monday, May 25 at 9:00 a.m. "What's New in Cardiovascular Disease" will be the discussion topic. F. J. Hirschboeck, M.D., of Duluth will be the moderator. Other members of the panel will be Henry I. Russek, M.D., of New York City and John W. Kirklin, M.D., Rochester. Dr. Culbertson is sponsored by the Minnesota Heart Association.



CUSHMAN D. HAAGENSEN, M.D.

New York, New York

Cushman D. Haagensen, M.D., Professor of Clinical Surgery, Columbia University, New York City, will participate in a Symposium on Breast Cancer, Monday, May 25, at 2:00 p.m. He will also participate in a 12:15 p.m. round table luncheon on Monday, on "Present Day Knowledge of the Etiology of Some Common Types of Cancer." Dr. Haagensen's appearance is sponsored by the Minnesota Division, American Cancer Society.

JOHN E. HARRIS, M.D.

Minneapolis, Minnesota

The Minnesota Academy of Ophthalmology and Oto-Laryngology Lecture will be presented Tuesday, May 26, at 11:00 a.m., by John E. Harris, M.D. Dr. Harris is Professor and Head, Department of Ophthalmology, University of Minnesota Medical School. Dr. Harris will also be the guest speaker at the Tuesday, May 26, luncheon of the Minnesota Acadamy of Ophthalmology and Oto-Laryngology, at 12:30 p.m. Dr. Harris is sponsored by The Minnesota Academy of Ophthalmology and Oto-Laryngology.





W. B. HILDEBRAND, M.D.

Menasha, Wisconsin

"Relationship of the General Practitioner to the Specialist" will be the address given by W. B. Hildebrand, M.D., at 9:30 a.m., Wednesday, May 27. Dr. Hildebrand, of Menasha, Wisconsin, is President of The State Medical Society of Wisconsin, and Past President of the American Academy of General Practice.

CAPTAIN JAMES R. KINGSTON

Medical Corps, U. S. Navy
Washington, D.C.

Captain James R. Kingston of the Medical Corps, U. S. Navy, will participate in two round table luncheons. On Tuesday, May 26, he will participate in the 12:15 p.m. luncheon "Immunization—Current Status." His second appearance will be on Wednesday, May 27, at the 12:15 p.m. luncheon "Oral Polio Vaccine."





JAMES E. LOFSTROM, M.D.

Detroit, Michigan

James E. Lofstrom, M.D., Chairman—Professor, Division of Radiology, College of Medicine, Wayne State University Detroit, Michigan, will present the Russell D. Carman Memorial Lecture, Monday, May 25, at 11:00 a.m. The title of his address will be "Breakthroughs in the Solution of the Stroke Problem." Monday afternoon at 4:00 p.m., he will participate in a panel discussion "Management of Strokes." In addition, Dr. Lofstrom will be the guest speaker at the dinner and annual meeting of the Minnesota State Radiological Society, scheduled for 6:00 p.m. at the Northland Country Club. Dr. Lofstrom is sponsored by the Minnesota Radiological Society.



MAURICIO MARTINS da SILVA, M.D.

Washington, D. C.

Mauricio Martins da Silva, M.D., Communicable Diseases Branch, Pan American Sanitary Bureau, Regional Office of the World Health Organization, Washington, D. C., will participate in the round table luncheon "Oral Polio Vaccine" at 12:15 p.m. on Wednesday, May 27.



THEODORE C. PANOS, M.D.

Little Rock, Arkansas

"Nutritional Requirements of the Neonate" will be the title of the Northwestern Pediatric Society Lecture which will be presented by Theodore C. Panos, M.D., Professor and Chairman, Department of Pediatrics, Medical Center, University of Arkansas, Little Rock, Arkansas, on Wednesday, May 27 at 11:30 a.m. He will also participate in a round table luncheon on "Nephrosis in Children" on Wednesday, May 27, at 12:15 p.m. Dr. Panos is sponsored by the Northwestern Pediatric Society and the Baker Laboratories, Inc., Cleveland, Ohio.

HENRY I. RUSSEK, M.D.

Staten Island, New York

Henry I. Russek, M.D., will participate in the panel discussion "What's New in Cardiovascular Disease" scheduled for 9:00 a.m., Monday, May 25. He will also participate in the Monday round table luncheon "Factors Responsible for the High Incidence of Clinical Coronary Atherosclerosis in the U. S." Dr. Russek is Consultant in Cardiovascular Research, U. S. Public Health Service Hospital, Staten Island, New York. He is sponsored by the Minnesota Heart Association.



CORNELIUS W. VERMEULEN, M.D.

Chicago, Illinois

Cornelius W. Vermeulen, M.D., will participate in a Symposium on Urological Problems, scheduled for Tuesday, May 26, at 2:00 p.m. His title in the Symposium will be "Formation of Stones." Dr. Vermeulen is Professor of Surgery (Urology), University of Chicago.

ROBERT I. WISE, M.D.

Philadelphia, Pennsylvania

"Resistance and Therapy" will be the presentation to be given by Robert I. Wise, M.D., at a Symposium on Staphylococcus Infections, scheduled for Wednesday, May 27, at 2:00 p.m. In addition, Dr. Wise will appear at a round table luncheon at 12:15 p.m. on Wednesday on "New Antibiotic Drugs." Dr. Wise is Magee Professor of Medicine and Head of Department of Medicine, The Jefferson Medical College of Philadelphia.



Minnesota State Medical Association

106th Annual Meeting

Duluth, Minnesota—May 25-27, 1959

Scientific Exhibits

Booth Number	
S-87	**Ambylopia** Richard O. Leavenworth, Jr., St. Louis Park Medical Center
S-4	**American Cancer Society, Minnesota Division, Inc.** "Every Doctor's Office—A Cancer Detection Center"
S-22	**American Red Cross Blood Program** American Red Cross
S-17	**Aortograms in Urology** Roger V. Haglund and Julian S. Ansell, Minneapolis Veterans Administration Hospital
S-90	**Basic Bacteriology for Office and Smaller Hospital** Richard T. Cushing and Jack A. Vennes, St. Louis Park Medical Center
S-88	**Blue Cross and Blue Shield** Minnesota Hospital Service Association and Minnesota Medical Service, Inc.
S-25	**Comparative Study of Iron Absorption from Gastrointestinal Tract** Donald R. Korst and Ronald C. Bishop, Veterans Administration Hospital, Ann Arbor, Michigan, and Simpson Memorial Institute, University of Michigan
S-13	**Decalcified Spine** James J. Coll and W. H. Goodnow, The Duluth Clinic
S-3	**Environmental Sepsis** A. H. Wells and Mirdza Peterson, B.A., M.T. (A.S.C.P.), St. Luke's Hospital, Duluth
S-2	**Gross Pathology Exhibit** John P. Knoedler, A. C. Aufderheide, Arthur H. Wells, Volker Goldschmidt; St. Mary's Hospital and St. Luke's Hospital, Duluth
S-18	**Hyperadrenalism: Diagnosis and Surgical Treatment** Bernard Zimmerman, J. C. Rosenberg, W. H. Moran; University of Minnesota Hospitals
S-20	**Kenny, Elizabeth, Institute** The Handicapped Can Work M. E. Knapp and Mr. Vernon A. Schultz
S-5	**Management of the Neurogenic Bladder in a Rehabilitation Center** Richard S. Rodgers, Bruce E. Linderholm
S-8	**Mayo Clinic and Mayo Foundation** Blood Smears—Their Value in General Diagnosis E. D. Bayrd and A. B. Hagedorn
	Diabetes Insipidus—Current Concepts in the Production of Antidiuretic Hormone with Clinical and Experimental Observations R. V. Randall, E. C. Clark, H. W. Dodge, Jr., R. C. Bahn, A. H. Bulbulian
	Lesions of the Oral Mucosa Harold O. Perry, Stanley A. Lovestedt
	Pain Patterns—Sites and Behavior of Pain in Certain Common Diseases of the Upper Abdomen L. A. Smith, N. A. Christensen, N. O. Hanson, D. E. Ralston, R. W. P. Achor, K. G. Berge, A. H. Bulbulian, G. W. Morrow, Jr.
S-30	**Minnesota Academy of General Practice**
S-6	**Minnesota Civil Defense and Disaster Blood Program** Minneapolis War Memorial Blood Bank Minnesota Association of Blood Banks Minnesota Department of Civil Defense Minnesota Hospital Association Minnesota State Board of Health Minnesota State Medical Association St. Paul Regional Blood Center of the American National Red Cross
S-21	**Minnesota Department of Health, Division of Hospital Services** New Hospitals and Nursing Homes
S-23	**Minnesota Society for Crippled Children and Adults, Inc.** Easter Seals at Work in Minnesota
S-8	**Minnesota State Medical Association** Committee on Conservation of Hearing Screening of Hearing in General Practice
S-10	**Minnesota State Medical Association** Committee on Pulmonary Diseases Minnesota Department of Health Histoplasmosis in Minnesota
S-9	**Minnesota State Medical Association Heart Committee, and Minnesota Heart Association** 1958 Rheumatic Fever Survey

Booth Number	
S-12	**Minnesota State Medical Association and Minnesota Department of Health** Accidents: Childhood's Greatest Health Hazard
S-80	**Minnesota State Pharmaceutical Association**
S-1	**Minnesota Tuberculosis and Health Association, Hennepin County Tuberculosis Association, St. Louis County Tuberculosis Association, Ramsey County Tuberculosis and Health Association** Tuberculosis in Minnesota
S-16	**Muscular Dystrophy Association of America, Inc.** Manifestations of Muscular Dystrophy
S-7	**Physical Diagnosis of Facial Fractures** William P. Frantzich, D.D.S., Kenath H. Sponsel, Vernon E. McNeilus; Colonial Orthopedic and Accident Center
S-15	**Pressure Gradient Therapy in Stasis Ulcers** Joseph Beninson, Hugh Reynolds, Jerome Kopstein; Henry Ford Hospital, Detroit, Michigan
S-26	**Protecting the Diabetic Food from a Triple Threat** W. L. Lowrie, H. L. Johnson, J. B. Bryan, F. W. Whitehouse, E. A. Kish, W. E. Redfern; Henry Ford Hospital, Detroit, Michigan
S-89	**Q-Technique in Evaluation of Ataractic Drugs** Bernard C. Glueck, Jr., University of Minnesota
S-79	**Studies in Surgical Masking** Joseph Kiser and Claude Hitchcock; Minneapolis General Hospital
S-11	**Surgical Treatment of Benign Peptic Ulcer** Duluth Clinic, Department of Surgery (with the technical assistance of K. E. Schrader, B.S., Ph.C.; and D. G. Remick, B.S., Ph.C.)
S-24	**Surgical Treatment of Aortic Insufficiency by Conversion of the Tricuspid Aortic Valve to a Bicuspid Valve** Joseph J. Garamella, Minneapolis
S-24	**Test for Glaucoma After Age Forty** J. C. O'Neill, Duluth Clinic
S-14	**Triacetin (Glyceryl Triacetate) As a Fungicide** S. G. Knight, Ph.D. (University of Wisconsin) J. L. Tuura (University of Minnesota)
S-19	**University of Minnesota Hospitals, Department of Surgery** The Use of Local Gastric Hypothermia in the Treatment of Massive Upper Gastro Intestinal Hemorrhage Ward O. Griffen, Jr., Peter A. Salmon, James R. S. Paterson, Owen H. Wangensteen

Sports Events and Outings

A full day of sports events, varied to suit the several tastes of the members of the Minnesota State Medical Association attending the Annual Meeting, have been scheduled for Sunday, May 24.

Major events are the Golf Tournament and the Skeet and Trap Shoot.

Golf Tournament

The Annual Golf Tournament will be held at Duluth's Northland Country Club. Tee-off time will be 10:00 a.m.-12:00 noon. Cocktails and Buffet have been scheduled for 5:00 p.m. Golfers and their wives are invited to attend.

Entry fee for the Golf Tournament is $5.00, and the tickets for the Buffet are $2.50 per plate.

Persons planning to participate are asked to make reservations on the card for that purpose enclosed with the Annual Meeting Program.

Skeet and Trap Events

The Annual Skeet and Trap Shoot will start at 10:30 a.m., at the Proctor Gun Club, just west of Proctor on Highway Number Two.

High Tower: Special twenty-five bird event at De Loia's Kennels, near Pike Lake, Highway Number 53. Time—2:30 p.m.

Pigeon Shoot: Live pigeons will be available for a special event following the Tower event if enough persons indicate they are interested.

Trophies: The Malcolm Pfunder Skeet Trophy and the Vernon D. E. Smith Razzle Dazzle Trophy, both held for one year only, will be awarded. The Trap Committee Trophy of 1953, also a rotating trophy, will be awarded for trap shooting. Additional attractive prizes will be available. Make reservations for all shooting events with E. E. Barrett, M.D., on the reservation card enclosed with the Annual Meeting Program.

Boat Trips

Duluth-Superior Harbor and Lake Superior Boat Trips, viewing new St. Lawrence Seaway Terminus. Boats will leave on Sunday, May 24, at 3:00 p.m., and on Monday, Tuesday, and Wednesday at 10:00 a.m., and 3:00 p.m., at Lake Avenue Dock for two-hour trips.

Price—$2.00 for adults and $1.00 for children under 12. Make reservations with C. M. Bagley, M.D., on the card enclosed for that purpose with the Annual Meeting Program.

Minnesota Blue Shield—Blue Cross

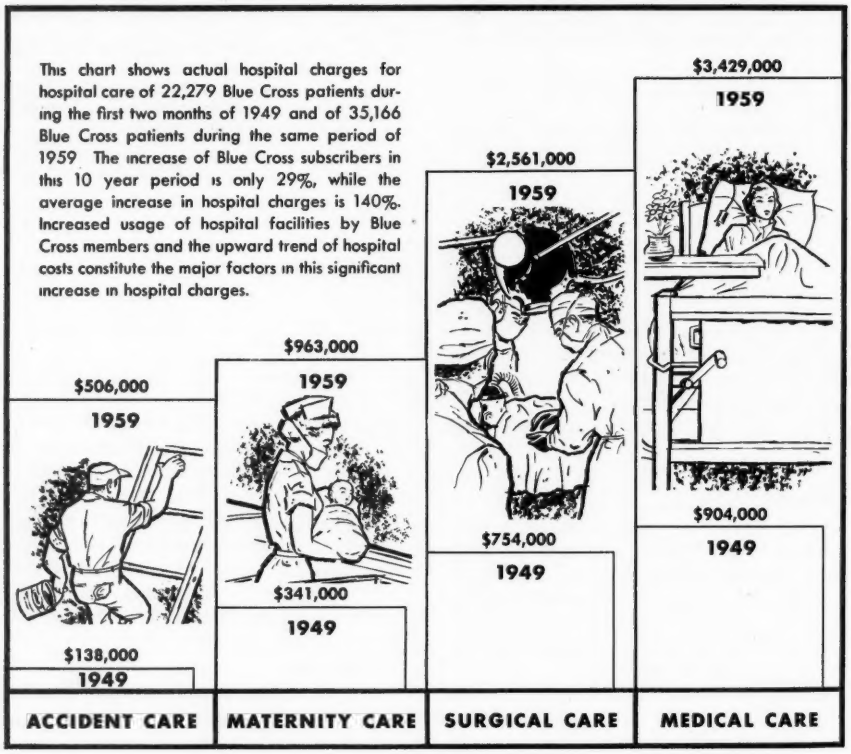
The fact that utilization of the Blue Shield contract by participant subscribers continued to increase during 1958 is shown by a comparison of the number of services of physicians provided Blue Shield benefits per 1,000 contracts and per 1,000 subscribers during 1958 and 1957.

During 1958, Blue Shield provided benefits for 1,109 physicians' services per 1,000 contracts, or 416 services per 1,000 participant subscribers. In the previous year, 1957, Blue Shield benefits were provided for 963 services of physicians per 1,000 contracts, and 362 services per 1,000 participant subscribers. These figures clearly illustrate the increased incidence and utilization experienced by Blue Shield in 1958 over 1957. During 1958, Blue Shield benefits were provided for well over one service for every contract in effect, while during 1957 benefits were provided for slightly less than one service for each contract in effect.

Percentage-wise, the increase in the number of doctors' services provided Blue Shield benefits per 1,000 subscribers and per 1,000 contracts in 1958 over 1957 is approximately 15 per cent. This percentage increase also illustrates the increased incidence and utilization experienced by Blue Shield in 1958.

During 1958, a total of 365,654 services of doctors were provided Blue Shield benefits, while during 1957 Blue Shield provided benefits for 307,171 physicians' services rendered subscribers. The number of services for which Blue Shield provided benefits in 1958 is approximately 19 per cent greater than the number of services provided benefits during 1957.

10 YEAR COMPARISON OF HOSPITAL CHARGES FOR BLUE CROSS PATIENTS



The Art of Medicine

PR

Carl H. Woyke, B.A.
Editor

YOU CAN OFFER PERSONAL AND FAMILY HEALTH RECORDS

How often have you asked a patient one of these questions: "Are you allergic or sensitive to certain drugs or other substances?" "What is your blood type?" "Who is your personal physician?" "Your next of kin?" "Have you received vaccination for polio, tetanus, smallpox, typhoid?"

Needless to say, you have frequently tended the needs of a person who is unconscious due to severe illness, injury or shock, or some other situation which has made it impossible for the person to speak for himself.

Here's the opportunity for members of the Minnesota State Medical Association to help provide accurate answers to these questions which may some day mean the difference between the life and death to the person involved. Because having important personal health facts readily available for any health emergency is so important, you, the members of the Minnesota State Medical Association are used to co-operate in the distribution of personal and family health records to your patients.

The billfold size personal health records, provide space only for essential health information. More detailed information may be recorded in the family health records. Both forms are available in quantity without charge from the Minnesota State Medical Association, 496 Lowry Medical Arts Building, St. Paul 2, Minnesota.

PROGRAM CHAIRMAN—HERE'S A TIP

Are you a Program Chairman charged with the responsibility of providing a worthwhile presentation at your next County Medical Society, Lion's Club, American Legion, or congregational men's club meeting? Why not select an appropriate title from sound films available through the Motion Picture Library, American Medical Association. Available are films for every occasion or purpose—titles for professional and lay-audience groups alike.

For many films, there is only a return-shipping charge required. For others, a minimum film rental is charged. Lists of available films from the Motion Picture Library of the American Medical Association, are available from the Minnesota State Medical Association, 496 Lowry Medical Arts Building, St. Paul 2, Minnesota.

The following is only a partial list of the various films available.

"The Man Who Didn't Walk"—Black and white, sound, 1145 feet, showing time 32 minutes. Produced by Dynamic Films, Inc., New York, for The Wm. S. Merrell Co., The American Bar Association, and the American Medical Association. Recommended for Professional groups only.

This, the third film in the series on doctor and lawyer relations, develops a case of traumatic neurosis. Medical examinations and court room procedure are used to show areas of conflict. The film testimony of competent experts represents two entirely different viewpoints.

"San Francisco Highlights (1958)"—Black and white, sound, 1073 feet, showing time 30 minutes. Presented by the American Medical Association in co-operation with Merck Sharp and Dohme.

Abstracts of some of the papers presented during the 1958 Annual Meeting of the American Medical Association. Includes a discussion on cancer and viruses by Wendell M. Stanley, a report on hypnosis by Milton J. Marmer, a study on blood alcohol levels among drivers killed in single vehicle accidents, an interview with Col. John P. Stapp who rode a rocket driven sled and an interview with Charles E. MacArthur who introduced the program of annual physical examinations for physicians.

"Choosing A Doctor"—Black and white, sound, 500 feet, showing time 14 minutes. Produced by Crawley Films, Toronto, for McGraw Hill Book Co.

Fred Morris' young daughter had an appendicitis attack and he didn't know where to turn . . . until he remembered a "doctor" he had met on the golf course. Fred was lucky . . . he hit upon a reputable physician, but he learned the lesson that only a wisely selected personal physician will afford the peace of mind and the knowledge that his family will be protected with competent medical care at all times.

"Helping Hands for Julie"—Black and white, sound, 973 feet, showing time 27 minutes. Produced by Henry Strauss & Co., Inc., New York for the American Medical Association, American Hospital Association, and E. R. Squibb & Sons.

This is a film on career opportunities in medicine and health. The story of Julie revolves around her fight for life when she is brought into the hospital emergency room—diagnosis: unknown. The helping hands aiding the doctors in this vital search for the correct diagnosis are those of nurses, medical technologists, x-ray technicians and the medical record librarian. The film is designed to attract students into these careers by dramatizing their opportunities.

"The Medicine Man"—Black and white, sound, 973 feet, showing time 27 minutes. Produced by Monopegic Productions, Hollywood, for the American Medical Association.

How "medicine men" dupe the public into spending millions of dollars on unnecessary or over-priced nutritional products is shown in this film. It dramatically pinpoints the fight against quackery in the food and nutrition field.

"Red River of Life, Part 1"—Color, sound, 1028 feet, showing time 28 minutes. Prepared by the Moody Institute of Science, West Los Angeles, California.

This film, which deals primarily with the heart and the circulatory system, compares the human body with an automobile engine and shows how they both have need of fuel and removal of waste. How the valves of the heart work under varying conditions of high and low blood pressure and even shock is seen by means of pictures of the valves in action which were taken with the cardiac pulse duplicator. An x-ray motion picture shows a plastic artificial heart valve at work in a patient and the heart lung machine is explained.

DOCTORS' BUSINESS PRACTICES REFLECT PROFESSIONAL PUBLIC RELATIONS

Physicians should remember that one doctor or medical secretary who treats the patient rudely can erase the good impression created by ten thoughtful colleagues, is the advice given in *PR Doctor* issued by the Communications Division of the AMA.

In order to emphasize the value of sound business practices and the importance of good doctor-patient relationships, the following case history and subsequent advice was given by *PR Doctor*:

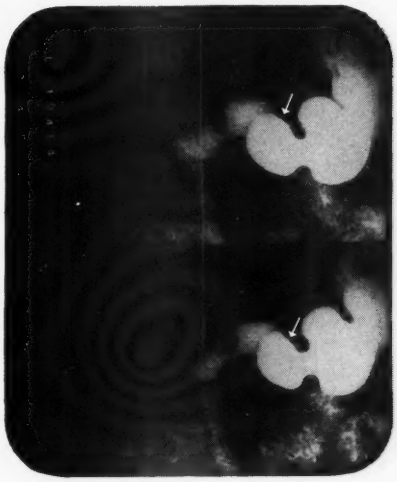
Recently a letter was received from a public relations man whose personal brush with a medical group's business methods prompted him to give some professional advice—gratis.

The man's wife had recently undergone surgery and he had been incensed to find the surgeon's bill placed alongside her hospital bed four or five hours after the operation. This practice plus the answer he received to his letter of complaint, he felt, left something to be desired in at least one group of doctors' public relations program. So he paid his bill but included this advice:

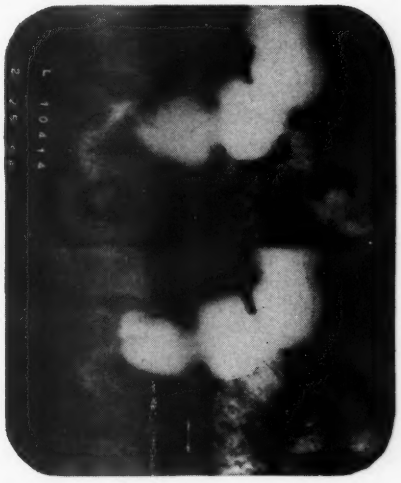
"Medical people should learn that no matter how much they want to operate like a commercial business, to sell services as one does shoes, they can never turn this trick because doctors are called in when people are in trouble. In an emotional situation, business logic disappears. Even if doctors are right from a purely business point of view they cannot escape the fact that the recipient of the services does not view it as a business situation at the time of crisis."

The gist of the man's recommendation is pure and simple finesse. Medical business practices should never be so crass that they shock perfectly intelligent and cooperative patients. Letters of complaint (no matter who is at fault) should never be answered curtly or in a tone of indignant righteousness.

—and control its G.I. sequelae



Patient A.S., age 53.
Intermittent crises of severe pain over 2 year period; hospital management with Sippy regimen provided relief of symptoms; however, symptoms recurred after each sojourn.



PATHIBAMATE *(Tabs. j t.i.d. and H.S.);* prompt relief of symptoms. Radiograph (21 days later) confirms healing of minute lesser curvature gastric ulcer crater.

predictable results in the control of tension and G.I. trauma

Pathibamate®

Meprobamate with PATHILON® Tridihexethyl Chloride* LEDERLE

Used prophylactically in anticipation of periods of emotional stress, or therapeutically to relieve tension and curb hypermotility and hypersecretion, PATHIBAMATE is particularly well-formulated for the control of gastrointestinal disorders.

PATHIBAMATE combines Meprobamate (400 mg.) — the noted tranquilizer-muscle relaxant widely accepted for safe management of tension and anxiety states — and PATHILON (25 mg.) — an extremely well-tolerated anticholinergic, long noted for prompt symptomatic relief based on peripheral atropine-like action with few side effects.

Indications:
Duodenal ulcer, gastric ulcer, intestinal colic, spastic and irritable colon, ileitis, esophageal spasm, anxiety neurosis with gastrointestinal symptoms, gastric hypermotility.

Supplied:
Bottles of 100 and 1,000. Each tablet (yellow, ½-scored) contains Meprobamate, 400 mg.; PATHILON Tridihexethyl Chloride, 25 mg.

Administration and Dosage:
1 tablet three times a day at mealtimes and 2 tablets at bedtime. Adjust dosage to patient response. Contraindicated in glaucoma, pyloric obstruction, and obstruction of the urinary bladder neck.

Also Available: PATHILON in four forms — *Tablets* of 25 mg., plain (pink) or with *phenobarbital*, 15 mg. (blue);
Parenteral — 10 mg./cc. — 1 cc. ampuls;
Pediatric Drops — 5 mg./cc. — dropper vials of 15 cc.

*PATHILON is now offered as tridihexethyl chloride instead of the iodide, an advantage permitting wider use, since the latter could interfere with the results of certain thyroid function tests.

Lederle LEDERLE LABORATORIES, A Division of AMERICAN CYANAMID COMPANY, Pearl River, New York

Meetings and Announcements

STATE

MINNESOTA STATE MEDICAL ASSOCIATION, 106th Annual Meeting, Hotel Duluth, Duluth, Minnesota, May 25-27, 1959.

Minnesota Surgical Society, Spring Meeting, Duluth, Minnesota, July 17; Fall Meeting, Minneapolis, Minnesota, October 30, 1959.

REGIONAL

Society of Nuclear Medicine, Sixth Annual Meeting, Palmer House, Chicago, Illinois, June 18-20, 1959. Additional information obtained from Samuel N. Turiel, Administrator, The Society of Nuclear Medicine, 750 No. Michigan Avenue, Chicago 11, Illinois.

NATIONAL

The American Association of Blood Banks, Twelfth Annual Meeting, November 4-7, 1959, Edgewater Beach Hotel, Chicago, Illinois. For further information, write Office of the Secretary, American Association of Blood Banks, 30 North Michigan Avenue, Chicago 2, Illinois.

American Medical Association 108th Annual Meeting, Atlantic City, New Jersey, June 8-12, 1959.

The American College of Chest Physicians, Silver Anniversary Meeting, Ambassador Hotel, Atlantic City, June 3-7, 1959.

The American College of Physicians presents:

Postgraduate Course No. 4; Psychiatry for the Internist, June 1-5, 1959, Psychiatric Institute, University of Maryland Hospital, Baltimore, Maryland.

Postgraduate Course No. 5; Special Topics in Internal Medicine, June 15-19, 1959, Denison Auditorium, Denver, Colorado.

Postgraduate Course No. 6; Internal Medicine—Selected Topics, June 22-26, 1959, Mont Reid Pavilion, Cincinnati General Hospital, Cincinnati, Ohio.

The American College of Surgeons sectional meetings:

September

Annual Clinical Congress, Atlantic City, New Jersey, September 28-October 2. Dr. Michael L. Mason, Secretary, 40 East Erie Street, Chicago 11, Illinois.

American Heart Association, Annual Meeting and Scientific Sessions, October 23-27, 1959, Philadelphia. Scientific Sessions scheduled for October 23-25 at Trade and Convention Center. Annual Meeting of the National Assembly, Hotel Bellevue Stratford, October 26-27. Information available from Minnesota Heart Association, 1821 University Avenue, St. Paul 4, Minnesota.

National Society for Crippled Children and Adults, Annual Convention, November 29-December 2, 1959, Palmer House, Chicago. For further information, write Miss Catharine Bauer, Director of Information, 2023 West Ogden Avenue, Chicago 12, Illinois.

New York University Post-Graduate Medical School offers: Symposium on Modern Therapeutics in Internal Medicine, Full-time, June 8-19; Clinical Gastroenterology, Full-time, June 22-26; The Management of Chronic Kidney Disease, Full-time, June 22-23; The Management of Hypertension, Full-time, June 24-25. Write Office of the Associate Dean, New York University Post-Graduate Medical School, 550 First Avenue, New York 16, New York.

Oregon Cancer Conference, sponsored jointly by the Oregon State Medical Society, the Oregon Division of the American Cancer Society, the University of Oregon Medical School and the Oregon Academy of General Practice, July 16-17, 1959, Portland, Oregon.

Pan-Pacific Surgical Association, Eighth Congress, Honolulu, Hawaii, September 28 through October 5 in 1960. Further information and brochures may be obtained by writing to Dr. F. J. Pinkerton, Director General of the Pan-Pacific Surgical Association, Suite 230, Alexander Young Building, Honolulu 13, Hawaii.

Second Annual Postgraduate Refresher Course, University of Southern California School of Medicine, July 29-August 15, 1959, Honolulu, Hawaii, and on board *The SS Lurline*. For information, write, Director, Postgraduate Division, U.S.C. School of Medicine, 2025 Zonal Avenue, Los Angeles 33, California.

Society of Nuclear Medicine, Sixth Annual Meeting, The Palmer House Hotel, Chicago, Illinois, June 18-20, 1959.

Trudeau School of Tuberculosis and Other Pulmonary Diseases, Fourty-fourth Session, Saranac Lake, New York, June 8-26, 1959.

INTERNATIONAL

Eighth Bahamas Medical Conference, British Colonial Hotel, Nassau, Bahamas, November 27 until December 17, 1959.

Second Bahamas Surgical Conference, British Colonial Hotel, Nassau, Bahamas, December 28, 1959 until January 16, 1960.

International College of Surgeons, Twelfth Biennial International Congress, Rome, Italy, May 15-18, 1960.

(Continued on Page 626)



Clear the air

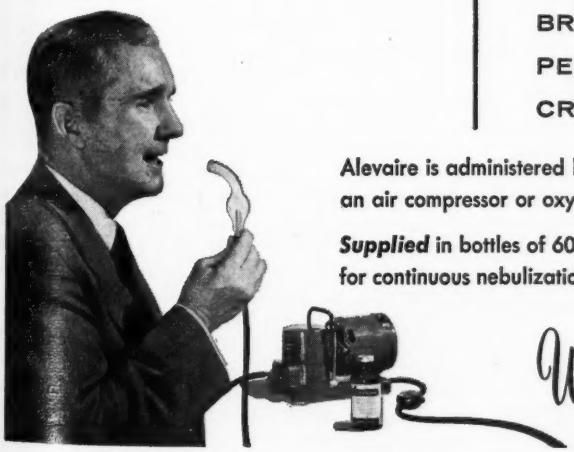
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1400 Harmon Place, Minneapolis 3, Minnesota

INTERNATIONAL

(Continued from Page 624)

North American Federation, Twenty-Fourth Annual Congress, International College of Surgeons, Chicago, September 13-17. For information, write The Secretariat, International College of Surgeons, 1516 Lake Shore Drive, Chicago 10.

The First International Medical Conference on Mental Retardation, July 27-31, 1959, The Eastland Hotel, Portland, Maine.

Fourth International Goiter Conference, July 5-9, 1960, London, England, under the auspices of the London Thyroid Club and the American Goiter Association. Application blanks are available from John C. McClintock, M.D., 149½ Washington Avenue, Albany 10, New York, U.S.A.

AMA ANNUAL MEETING WILL FEATURE 450 PHYSICIAN SPEAKERS

Hypnosis, staphylococcal infections, blood cell disorders, space medicine, European spas, and aging are among the subjects to be considered at the 108th Annual Meeting of the American Medical Association, June 8-12, in Atlantic City.

Some 450 physicians will present scientific papers or participate in panel discussions and symposiums during the meeting. In addition, there will be 387 scientific exhibits shown by physicians and 285 industrial exhibits prepared by pharmaceutical houses, medical equipment firms, and other business organizations.

Most of the scientific sessions, along with the exhibits, will be held in the Atlantic City Convention Hall. Some scientific meetings will be held in hotels.

Seven of the twenty-one sections of the scientific assembly mark their 100th anniversaries during the meeting. They are the sections on surgery, internal medicine, obstetrics and gynecology, experimental medicine and therapeutics, pathology and physiology, nervous and mental diseases, and preventive medicine.

Other features of the scientific program will include color television and motion pictures. Two films of special interest to be premiered deal with staphylococcal infections in hospitals and radiation protection in diagnostic radiologic examinations.

The House of Delegates, with its 210 members, will meet throughout the week in the Traymore Hotel, headquarters for the meeting. The House will select a physician to receive the Distinguished Service Award at its opening session Monday morning, June 8. Winner of the Goldberger Award, given for outstanding contributions in the field of nutrition, will also be announced Monday. The winner will present the annual Goldberger lecture at the opening of the general scientific session Monday afternoon.

Dr. Louis M. Orr, Orlando, Florida, will be inaugurated president of the AMA Tuesday evening. The inaugural will be followed by a reception and ball. Lester Lanin and his twenty-piece orchestra, internationally known dance band, will provide the music for the ball in Convention Hall.

MONOGRAPH PRIZES OFFERED BY THE AMERICAN ACADEMY OF ARTS AND SCIENCES

Three prizes of $1,000 each will be awarded annually to the authors of especially meritorious unpublished monographs, one each in the fields of the Humanities, Social Sciences, Physical and Biological Sciences.

A monograph is defined for the purposes of these awards as a "scholarly contribution to knowledge, too long for an article in a learned journal and too specialized or too short for a general book." Final date for receipt of manuscripts is October 1, 1959. For further information write the Committee on Monograph Prizes, American Academy of Arts and Sciences, 280 Newton Street, Brookline Station, Boston 46, Massachusetts.

1959 RURAL MEDICAL SCHOLARSHIP WINNER NAMED



The Rural Medical Scholarship recipient for 1959 is LeRoy Earl Mueller, a native of Belle Plaine, Minnesota. He received his premedical college training at Gustavus Adolphus College of St. Peter, Minnesota, and is a member of the freshman class in the University of Minnesota Medical School.

LeRoy Mueller is the seventh person to receive this scholarship established by the Association to assist worthy and outstanding students to meet the expense of a medical education, as well as to help insure a supply of physicians in non-metropolitan Minnesota communities.

According to the provisions of the scholarship, LeRoy Mueller will receive $1,000 each year for four years on the condition that he promises to practice medicine for at least five years after graduation from medical school in a rural Minnesota community.

Previous Rural Medical Scholarship winners now practicing medicine include Dr. Richard Engwall, Ivanhoe, and Dr. Leland Christenson, Maple Plain. Interning at Bethesda Hospital, St. Paul, is Myron Doebler, Princeton. Attending the University of Minnesota Medical School are Carl E. Christenson, Stanchfield, Senior; Vincent R. Hunt, Anoka, Junior, and Edward S. Peterka, Aurora, Sophomore.

NEUROPHYSIOLOGY RESEARCH FUNDS AVAILABLE

The Dysautonomia Association has announced that funds are now available for basic or clinical research in neurophysiology.

The Association will support research related to the clinical entity known as familial dysautonomia, a disease caused by dysfunction of the autonomic nervous system. It will also support any type of study that might lead to a better understanding of nervous system functions at a basic level as a stepping stone to the understanding of a disease process.

The Association will submit all requests for grants to its medical advisory board for evaluation. Requests should

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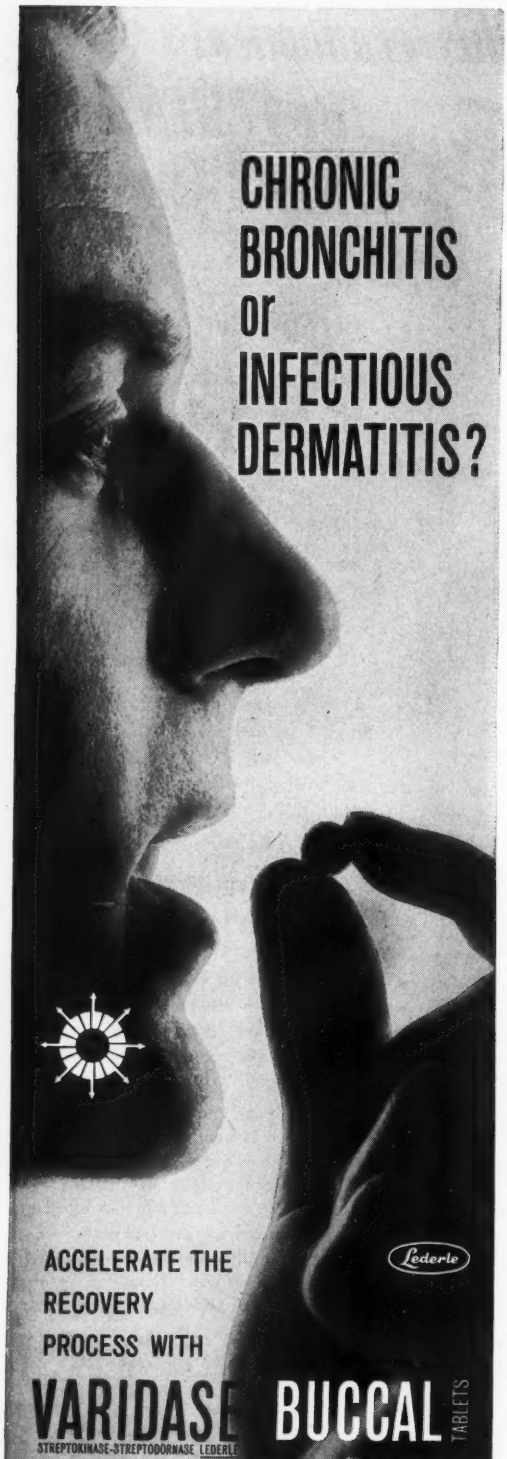
With the growth of the medical clinic there has come the need for a new type of table. The P&H TREATMENT TABLE meets that need with both style and economy. We know you will agree that this is the best table value in years. It is a quality table that you will be proud to own and will, we are sure, find it an excellent table for your "second" examination room.

This sturdily constructed table is made of the finest genuine Canadian Birch—solid wood legs and rails with birch-face five-ply panels for drawer and door fronts. It is offered in one standard finish only—natural wood in a golden blond color. It has six drawers and one compartment accessible from either side. There is a three position headrest, sliding stirrups, sliding leg rest and foot step. Upholstered with brown DuPont Fabrilite with 2" of padding.

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be addressed to Harold M. Newman, President, Dysautonomia Association, 2 West 46th Street, New York 19, New York.

OPENINGS IN GRADUATE COURSES

The Post-Graduate Medical School of the New York University-Bellevue Medical Center announces a few openings in graduate courses available during the 1959-1960 academic year. They may be taken as part of a residency program or in preparation for specialty board examinations.

Courses in the following fields are offered: Anesthesiology, Dermatology and Syphilology, Medicine, Orthopedic Surgery (January 1960), Otorhinolaryngology, Radiology, Surgery.

Further information may be obtained by writing or phoning the Office of the Associate Dean, New York University Post-Graduate Medical School, 550 First Avenue, New York 16, N. Y.

SYMPOSIUM ON DISEASES OF THE LIVER AND BILE DUCTS

A Symposium on Diseases of the Liver and Bile Ducts will be presented by the Lake Region Hospital Staff and Park Region Medical Society at Fergus Falls, Minnesota, on June 20, 1959. The following is an outline of the program:

Physiology of the Liver—ARTHUR SETHRE, M.D., Fergus Falls, Minnesota
Diagnostic and Laboratory Procedures—JAMES B. CAREY, M.D., Department of Medicine, University of Minnesota
X-ray Investigation—WARD SHAVER, M.D., Fergus Falls, Minnesota
Jaundice—WILLIAM SUMMERSKILL, M.D., Department of Gastroenterology, Mayo Clinic, Rochester
Cirrhosis of Liver—JOHN HUTCHINSON, M.D., Department of Medicine, University of Minnesota
Surgical Aspects
Gallstone Diseases—P. H. T. THORLAKSON, M.D., University of Manitoba, Winnipeg, Canada
Common Duct Diseases—GEORGE HALLENBECK, M.D., Department of Surgery, Mayo Clinic, Rochester
Neoplastic Diseases—RICHARD VARCO, M.D., Professor of Surgery, University of Minnesota

Credit will be allowed by the Minnesota Academy of General Practice for this symposium.

EXHIBITION OF ART WORKS BY AMERICAN PHYSICIANS

The 22nd Annual Exhibition of Art Works by American Physicians will take place June 8 through June 12 at Convention Hall in Atlantic City, according to Richard H. Gwartney, President of the American Physicians Art Association.

Held in conjunction with the annual convention of the American Medical Association, the show will include more than 550 works of art in oil, water color, sculpture, crafts, photography and lithography.

Participants and prospective exhibitors may obtain further information from Regional Director, F. A. Zinter, M.D., 600 Physicians and Surgeons Building, Minneapolis 2, Minnesota.



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A tiny tablet of REDISOL to stimulate the appetite — to help in the intake of food for growth.

REDISOL is crystalline vitamin B_{12}, an essential vitamin for growth and the fundamental metabolic processes.

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Also available as a pleasant-tasting cherry-flavored elixir (5 mcg. per 5-cc. teaspoonful) and as REDISOL injectable, cyanocobalamin injection USP (30 and 100 mcg. per cc., 10-cc. vials and 1000 mcg. per cc. in 1, 5 and 10-cc. vials).

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Woman's Auxiliary

DULUTH HOSPITALITY WILL SPARK THIRTY-SEVENTH ANNUAL MEETING

The Woman's Auxiliary to the St. Louis County Medical Society, hostesses for the Thirty-Seventh Annual Meeting, have pledged to make this a memorable occasion for all members attending. Arrowhead country hospitality will be the spark from the opening registration on Monday, May 25, at 9:00 a.m. to the closing "Round-Up Breakfast" on Wednesday, May 27, at 10:30 a.m.

Monday's get-acquainted activities will feature the Executive Board Meeting and Luncheon, at 10:30 a.m. and 1:00 p.m., respectively, in the Kitchi Gammi Club. At 3:00 p.m., all visiting women are cordially invited to be guests of the St. Louis County Medical Auxiliary at a Tea at the Tweed Art Gallery on the University of Minnesota, Duluth Campus. At 9:00 p.m., the annual Open House for all auxiliary members and their physician husbands, will be held in the Ballroom of Hotel Duluth.

The Annual Business Session, open to all auxiliary members, will begin at 9:30 a.m., Tuesday, May 26, in the Arrowhead Room of Hotel Duluth. Presiding will be Mrs. Reuben F. Erickson, State President. Other members participating in the Annual Meeting program activities include Mrs. William Finkelnburg, Winona, who will lead the Pledge of Allegiance; Mrs. John W. Stuhr, Stillwater, who will lead the Auxiliary Pledge; Mrs. Gordon Strewler, Duluth, President, St. Louis County Medical Auxiliary, giving the Address of Welcome; Mrs. Rodney Sturley, St. Paul, who will give the Response; Mrs. A. M. Jensen, Brownton, who will lead the In Memoriam Service with music by Mrs. A. C. Hilding, Duluth.

Mrs. Aaron Margulis, Santa Fe, New Mexico, National Committee Chairman for Mental Health, will be the guest speaker at the annual luncheon scheduled for 1:00 p.m. in the Ballroom of the Hotel Duluth. "The Physician's Wife—Generalist" will be the title of Mrs. Margulis' address. Mr. Eugene Lambert, former Mayor of Duluth, will also address the luncheon guests. His topic will be "What the Seaway will mean to Minnesota."

Other luncheon program activities will include the installation of officers; installation of president and presentation of president's pin; presentation of gavel, and the greetings from the new president. Following the conclusion of the luncheon activities, the post convention Board meeting will be held in the Arrowhead Room.

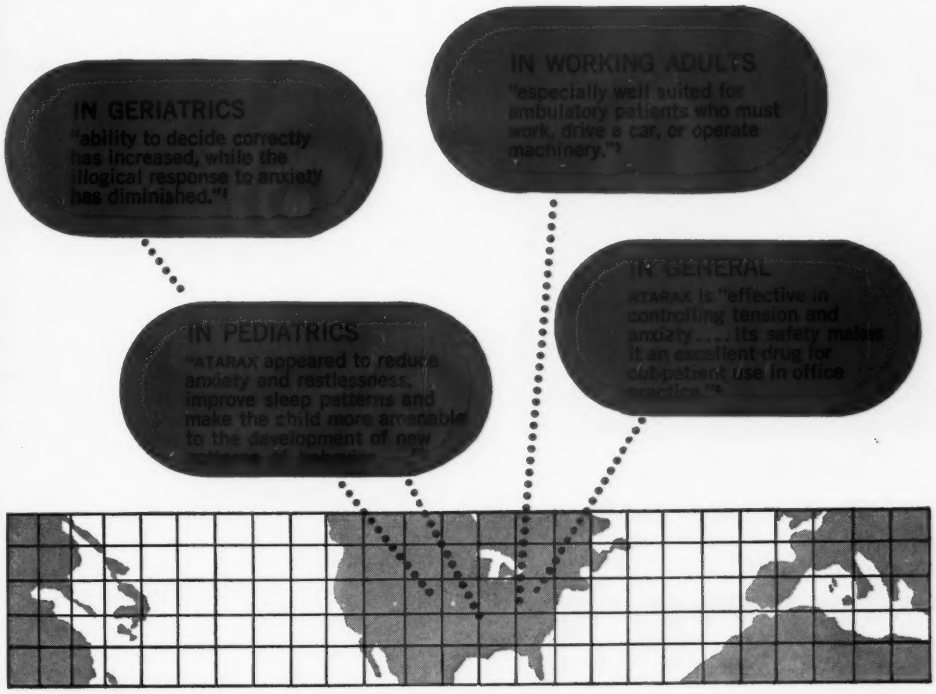
Tuesday's activities will conclude with the annual banquet for members of the Minnesota State Medical Association and auxiliary members at 7:00 p.m. in the Ballroom of Hotel Duluth. Presiding will be Dr. Benjamin B. Souster, President of the Minnesota State Medical Association. Dr. E. W. Ziebarth, Dean, Summer Session, University of Minnesota, will present the address of the evening. "Russia Today" will be the title of Dr. Ziebarth's address.

(Continued on Page 632)

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For childhood behavior disorders	10 mg. tablets	3-6 years, one tablet t.i.d. over 6 years, two tablets t.i.d.
	Syrup	3-6 years, one tsp. t.i.d. over 6 years, two tsp. t.i.d.
For adult tension and anxiety	25 mg. tablets	one tablet q.i.d.
	Syrup	one tbsp. q.i.d.
For severe emotional disturbances	100 mg. tablets	one tablet t.i.d.
For adult psychiatric and emotional emergencies	Parenteral Solution	25-50 mg. (1-2 cc.) intramuscularly, 3-4 times daily, at 4-hour intervals. Dosage for children under 12 not established.

Supplied: Tablets, bottles of 100. Syrup, pint bottles. Parenteral Solution, 10 cc. multiple-dose vials.

References: 1. Smigel, J. O., et al.: J. Am. Ger. Soc., in press. 2. Freedman, A. M.: Pediat. Clin. North America 5:573 (Aug.) 1958. 3. Ayd, F. J., Jr.: New York J. Med. 57:1742 (May 15) 1957. 4. Menger, H. C.: New York J. Med. 58:1684 (May 15) 1958. 5. Coirault, M., et al.: Presse méd. 64:2239 (Dec. 26) 1956. 6. Bayart, J.: Presented at the International Congress of Pediatrics, Copenhagen, Denmark, July 22-27, 1956.

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***TUCKS**...cleanses and soothes irritated surfaces when used as a wipe...cools and comforts the distress of chafing...encourages thorough cleaning*

*Recommend that mother keep **TUCKS** by the crib in their handy jars for routine cleansing after diaper change, and in the diaper bag when baby travels.*

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DULUTH HOSPITALITY WILL SPARK THIRTY-SEVENTH ANNUAL MEETING

(Continued from Page 630)

Additional introductions and presentations scheduled for the banquet include: Introduction of Mrs. M. F. Fellows, President, Woman's Auxiliary; and presentation of Fifty-Club Certificates, the Southern Minnesota Medical Association Medal and the Distinguished Service Award.

A "Round-Up Breakfast," scheduled for Wednesday, May 27, at 10:30 a.m. will climax the activities of the annual meeting.

REGION THREE HOLDS LUNCHEON MEETING

A Region Three luncheon meeting was held in Montevideo, recently, at the home of Mrs. William Miller, with Mrs. John Allen assisting her.

Mrs. M. I. Hauge, Region Three Advisor, was in charge of the meeting. Twenty members of the auxiliary, representing three county auxiliaries, were present.

Honor guests were Mrs. Reuben F. Erickson, State President, and Mrs. M. F. Fellows, State President-Elect. Mrs. Fellows extended greetings to Region Three. Mrs. Erickson gave a résumé of some phases of auxiliary work and told how small auxiliaries could work on some of the state projects.

The meeting closed with a talk on safety by Mrs. E. R. Hudec, State Safety Chairman.

AMA CONVENTION HIGHLIGHTS LISTED

The thirty-sixth annual meeting of the Woman's Auxiliary to the American Medical Association will be held June 8-12, 1959, at the Haddon Hall Hotel, Atlantic City, New Jersey. Hostesses for the occasion will be the Woman's Auxiliary to the Medical Society of New Jersey and the Woman's Auxiliary to the Atlantic County Medical Society.

The hosting groups have extended a most cordial invitation to all auxiliary members as well as other wives and guests of physicians attending the convention, to participate in the social functions and to sit in on the general sessions.

According to Margaret N. Wolfe, Executive Secretary, Atlantic City's natural attractions are almost too well known to need mention at this time. Perhaps the most famous feature of the city—which is actually located on an island five miles at sea and connected with the mainland by causeways—is the unique boardwalk. Sixty feet wide for much of its five-mile length, the boardwalk is constructed of steel and concrete and overlaid with pine planking in herringbone pattern. (Twenty miles of planks are required each year just to keep the boardwalk in good repair.) The city side is lined with huge hotels, blocks of fine stores and shops, restaurants, exhibit rooms, and theaters.

Auxiliary members are urged to make reservations at once.



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These antihistamines block the effect of histamine on the nasal and paranasal capillaries, preventing dilation and exudation.[3] *This is not enough;* by the time the physician is called on to provide relief, histamine damage is usually present and should be counteracted.

The decongestive action of orally active phenylpropanolamine helps contract the engorged capillaries, reducing congestion and bringing prompt relief from nasal stuffiness, rhinorrhea, sneezing and sinusitis.[4,5]

TRIAMINIC is orally administered, systemically distributed and reaches *all* respiratory membranes, avoiding nose drop addiction and rebound congestion.[6,7] TRIAMINIC can be prescribed for prompt relief in summer allergies, including hay fever.

References: 1. Sheldon, J. M.: Postgrad. Med. 14:465 (Dec.) 1953. 2. Hubbard, T. F. and Berger, A. J.: Annals Allergy p. 350 (May-June) 1950. 3. Kline, B. S.: J. Allergy 19:19 (Jan.) 1948. 4. Goodman, L. S. and Gilman, A.: Pharmacol. Basis Ther., Macmillan, New York, 1956, p. 532. 5. Fabricant, N. D.: E.E.N.T. Monthly 37:460 (July) 1958. 6. Lhotka, F. M.: Illinois M.J. 112:259 (Dec.) 1957. 7. Farmer, D. F.: Clin. Med. 5:1183 (Sept.) 1958.

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TRIAMINIC provides around-the-clock freedom from hay fever and other allergic respiratory symptoms with just one tablet q. 6-8 h. because of the special timed-release design.



Each TRIAMINIC timed-release tablet provides:

Phenylpropanolamine HCl	50 mg.
Pheniramine maleate	25 mg.
Pyrilamine maleate	25 mg.

Also available: TRIAMINIC SYRUP for those patients of all ages who prefer a liquid medication. Each 5 ml. teaspoonful is equivalent to ¼ Triaminic Tablet or ½ Triaminic Juvelet. TRIAMINIC JUVELETS provide half the dosage of the Triaminic Tablet with the same timed-release action for prompt and prolonged relief.

STOP *running noses* *and open stuffed noses orally*

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Communications

TUBERCULOSIS CONTROL IN THE HOSPITAL

To: Chiefs of Staff— Roentgenologists—Administrators of all licensed hospitals in Minnesota

Dear Doctor:

In order to protect the hospital patient and hospital personnel against tuberculosis, the Committee on Pulmonary Diseases of the Minnesota State Medical Association recommends that each staff set up its own "PROTECTION PROGRAM."

Since the routine admission chest X-ray film is the common screening agent, it is suggested that the following plan may be effective when the roentgenologist sees a film suggestive of tuberculosis:

1. That he immediately notify the attending physician, the administrator, and the chairman of the hospital infection committee.
2. That the responsibility for isolation and diagnosis of the lesion rests with the attending physician.

The details of this suggested method should be modified to meet the needs of the individual hospital.

Sincerely,
JOHN F. BRIGGS, M. D.

Saint Paul, Minnesota
March 6, 1959



This Section is for you to voice your convictions, comments, and queries on all subjects political, economic, historic, humorous, scientific or otherwise, to many physicians. Writings not sufficiently formal and too brief for an editorial or a scientific manuscript are requested. Clinical and research observations, no matter how brief, similar to those in *The Lancet* (London), are particularly encouraged.

ERROR IN IDENTIFYING DRUG

Dear Doctor:

Through an error in this section, a drug was wrongly identified in the article by Drs. Winkelmann and Brunsting that appeared in your January issue.

We and the authors would appreciate having it set right by publication of a note:

ERRATUM

"Edathamil disodium (calcium disodium) versenate" in lines 37-38, right column, page 14 of the January, 1959, issue should read "edathamil disodium (disodium versenate)."

We are sorry to have committed this mistake that involved your journal, and hope we have chosen the most effective and least troublesome way to correct it.

Yours truly,
GUY WHITEHEAD, PH.D.
Consultant

Mayo Clinic
Section of Publications
Rochester, Minnesota
April 14, 1959

NEW FORMAT APPROVED

We have received our April, 1959, issue of the "Minnesota Medicine." We are delighted with the cover page and we think that you have done very well with this, indeed. We also want to compliment you on the manner in which you handled the beginning of scientific articles. The generous use of "white space" certainly contributes an effective and attractive presentation of the material.

You and your staff are certainly making progress that you should be very proud of.

Sincerely,
J. P. SANFORD
Managing Editor
The Journal of the Kentucky State Medical Association

Louisville, Kentucky
April 22, 1599



To the relief of musculoskeletal pain, new MEDAPRIN* adds restoration of function

Analgesics offer temporary relief of musculoskeletal pain, but they merely *mask* pain rather than getting at its *cause*. New Medaprin, in addition to bringing about prompt subjective improvement, promotes the *restoration of normal function* by suppressing the inflammation that *causes* the pain.

Medaprin, Upjohn's new analgesic-steroid combination, contains aspirin plus Medrol,** the corticosteroid with *the best therapeutic ratio in the steroid field.*† Instead of suffering recurrent discomfort because of the "wearing off" of analgesics, the patient on Medaprin experiences a smooth, *extended* relief and more normal mobility.

Indications: Medaprin is indicated in mild-to-moderate rheumatic and musculoskeletal conditions, including rheumatoid arthritis, deltoid bursitis, low back pain, neuralgia, synovitis, fibromyositis, osteoarthritis, low back sprain, traumatic wrist, sciatica, and "tennis elbow."

Dosage: The recommended dosage is 1 tablet q.i.d. The usual cautions and contraindications of corticotherapy should be observed.

Supplied: In bottles of 100 and 500.

Formula: Each Medaprin tablet contains

- 300 mg. acetylsalicylic acid, for prompt relief of pain
- 1 mg. Medrol, to suppress the causative inflammation
- 200 mg. calcium carbonate, as buffer

*TRADEMARK **TRADEMARK, REG. U. S. PAT. OFF.— METHYLPREDNISOLONE, UPJOHN
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In Memoriam

CHARLES NORTON HENSEL

Dr. Charles N. Hensel, a prominent internist of St. Paul for many years, died on April 6, 1959, at the age of seventy-seven.

Dr. Hensel was born in Fargo, North Dakota, March 3, 1882, the son of John Henry Hensel and Anna Cecelia Norton and came to St. Paul at an early age. He graduated from Mechanic Arts High School and took three years in the College of Science, Literature and Arts at the University of Minnesota before taking the medical course, from which he graduated in 1908. He was a charter member of the Minnesota chapter of the Sigma Alpha Epsilon fraternity at the University and was a member of the Epsilon chapter of the medical fraternity, Nu Sigma Nu. He maintained his interest in Nu Sigma Nu and for a number of years was president of the Twin City Alumni Association of the fraternity, and was active in obtaining support of the Epsilon chapter by the alumni.

After graduation from medical school, Dr. Hensel interned at the Ancker Hospital in St. Paul and opened an office in the Moore Building at Seven Corners in January, 1910. He was associated with Dr. Charles Lyman Greene for a number of years. He took postgraduate work at the Harvard Medical School in the summer of 1917 and two six-month periods in Vienna in 1926 and 1928. For many years, he maintained offices in the Lowry Medical Arts Building and in January, 1958, became a member of the Fifty Club of the Minnesota State Medical Association after fifty years of medical practice.

Dr. Hensel was a member of the medical staff of St. Luke's, Miller, St. Joseph's, and Children's Hospitals. For a period of twenty years, he and Dr. E. Mendelsohn Jones conducted the staff meetings at Miller Hospital, and he was chairman of the medical division of the Hospital Building Fund campaign of Miller Hospital in 1948 when the Harry Zimmermann Wing was built.

He was especially interested in cardiology and allergy and published some fourteen articles in the field of internal medicine. He was president of the Minnesota Heart Society in 1954. He became a member of the Minnesota Academy of Medicine in 1932 upon presentation of his thesis entitled "Pitfalls in Cardiac Diagnosis," and served as president of the society in 1954. He was also a charter member of the Minnesota Society of Internal Medicine, which was founded in 1926, and became its president in 1938. Besides being a member of the Ramsey County Medical Society, the Minnesota State Medical Association, and the American Medical Association, he was a member of the American Board of Internal Medicine, the American College of Physicians, the Association for the Study of Allergy, the Association for the Study of Internal Secretions, the Minnesota Pathological Society, the Southern Minnesota Medical Association, and the St. Paul Clinical Club.

Dr. Hensel's interest in public speaking dates back to his high school days when he took part in dramatic presentations at Mechanic Arts High School. He continued his interest in dramatics at the University by taking part in the presentation of Shakespearian plays by the University Dramatic Society. He became a forceful speaker which contributed to his success in his chosen profession. He was a voracious reader and devoted to his profession. He was also an enthusiastic traveller, and he and Mrs. Hensel had visited Europe on five different occasions in addition to the two trips to Vienna in the twenties.

He was a member of St. John the Evangelist Episcopal Church and as a young man, sang in the church choir.

Dr. Hensel is survived by his wife, Florence (Schmit); a son, Carl N. of Wayzata; a daughter, Mrs. Richard (Lillian) Tyner of Alexandria, Virginia; a brother, Elliott C., of Glendale, California; and eight grandchildren.

JOHN J. McGROARTY

Dr. John J. McGroarty, who practiced medicine in Easton for sixty years, died April 6, 1959. He was seventy-eight years of age.

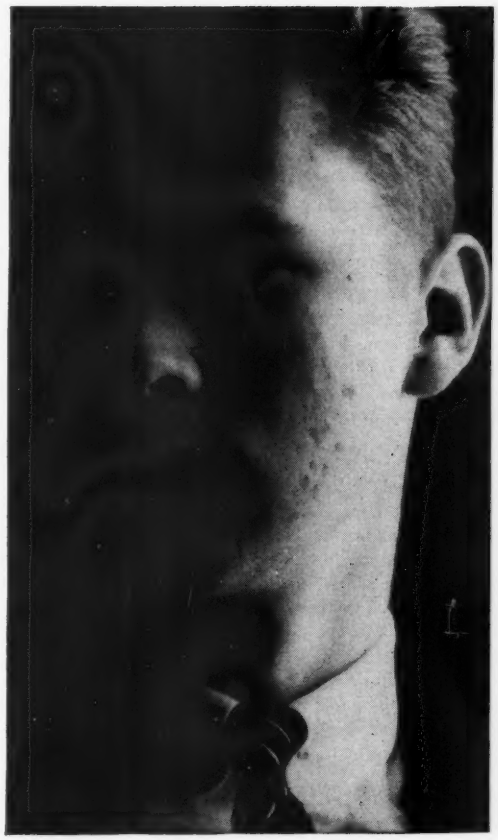
Dr. McGroarty was a native of Inver Grove, Minnesota, and received his preliminary education in the schools of that community and St. Thomas College of St. Paul. He moved to Easton following completion of his internship at Ancker Hospital, St. Paul. He graduated from the University of Minnesota School of Medicine in 1907.

Dr. McGroarty was granted life membership in the Minnesota State Medical Association in 1955 and became a member of the Fifty-Year Club in 1958. In 1956, Dr. McGroarty was named Rural Doctor of the Year at the National Catholic Rural Life Conference.

A member of the Blue Earth Valley Medical Society, he was also a member of the American Medical Association.

Dr. McGroarty is survived by his wife, Theresa, of Easton; a son, Dr. Brian McGroarty of St. Paul; two sisters, Mrs. Mary Corrigan, St. Paul, and Sister M. Basil, Minneapolis; two brothers, Bryan, St. Paul and William, Los Angeles.

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1. Hodges, F.T.: SP 14:86, Nov., 1956.

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The Physician's Diary

Dr. Stephen Silvis, who left Spring Valley for the Navy in 1957, returned recently and resumed his partnership with **Dr. N. J. O'Keefe.** Dr. Silvis and his family were stationed for two years in Hawaii.

* * *

Seven new consultants—six of them former Mayo Foundation fellows—have been named to the staff of the Mayo Clinic. The seven new consultants are: **Dr. Thomas L. Brannick,** consultant in psychiatry; **Drs. Arnold L. Brown, Jr.,** and **Chris A. Pascuzzi,** pathology; **Dr. George E. Plum,** radiology; **Drs. Alexander Schirger** and **Dr. John W. Worthington, Jr.,** medicine, and **Dr. Robert J. Spencer,** proctology.

* * *

Dr. Samuel N. Litman, a hard-working Duluth physician with a long record of community leadership, recently was named to Duluth's Hall of Fame. Dr. Litman was selected for Duluth's highest citizenship award primarily for his work with free baby clinics in West Duluth, the West End and downtown Duluth.

* * *

A Long Prairie physician, **Dr. M. E. Mosby,** was among 200 physicians attending a recent two-day medical meeting on arthritis and birth defects held in Chicago.

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A recent participant in the National Rehabilitation Association's regional conference held in Des Moines, was **Dr. G. Keith Stillwell,** consulting physician in the section of physical medicine and rehabilitation at the Mayo Clinic and an active leader in rehabilitation in Minnesota. About 315 specialists attended the meetings. Main speaker was Joseph Hunt, Assistant Director of the U. S. Office of Vocational Rehabilitation.

* * *

Dr. S. W. Giere, Benson, has received an award for fifteen years of service as medical advisor to the local selective service board. The certificate is signed in the name of President Eisenhower by Louis B. Hershey, national selective service director. Dr. Giere was also awarded a lapel pin for his service.

* * *

Dr. Hamilton Montgomery, Senior Consultant in the Section of Dermatology at the Mayo Clinic, and an internationally recognized authority on the microscopic aspects of diseases of the skin, assumed early emeritus status recently. Dr. Montgomery retired from active practice to devote full-time attention to the preparation of a volume on the subject of dermatohistopathology, a project which has been under way for a number of years and a field in which his career in medicine in recent years has been largely centered.

* * *

Dr. Jerome Hilger and **Dr. Woodard Colby,** St. Paul, were among speakers at a recent meeting of the Ramsey County Medical Society and the St. Paul District Dental Society. Problems related to both dentistry and medicine were discussed.

* * *

An Ely physician, **Dr. Manfred Dobler,** was elected chief of staff of the medical staff of the Ely-Bloomenson Community Hospital at a recent meeting. Elected as assistant chief of staff was **Dr. Edward W. Ciriacy.** Re-elected to the position of secretary was **Dr. Robert Kundel.** Other doctors on the staff include **Dr. J. P. Grahek, Dr. Jan Sekanina,** Babbitt, and **Dr. T. P. Mollers,** Soudan.

* * *

Drs. L. A. Aaro, D. G. Decker, J. E. Faber, J. S. Hunter, Jr., R. A. Smith and **R. B. Wilson,** Mayo physicians, were among 2,000 physicians attending the recent three-day Seventh Annual Clinical Meeting of the American College of Obstetricians and Gynecologists. The six Mayo physicians participated in round table discussions during the meeting.

* * *

Dr. C. L. Plott, Heron Lake, has announced that he and his family will move to Algona, Iowa, in the near future, where he will open a practice limited to surgery only. Dr. Plott has practiced medicine and surgery with

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Dr. R. W. Nicholson of Heron Lake, for the past three and one-half years.

* * *

The Journal Lancet recently honored **Dr. Winchell McK. Craig,** Head of the Section of Neurologic Surgery in the Mayo Clinic from 1946 to 1956, and emeritus professor of Neurologic Surgery in the Mayo Foundation, in a special article dealing with his career.

* * *

Dr. E. W. Arnold, Adrian, has consented to act in the capacity of Advisory Administrator of the new Arnold Memorial Hospital in Adrian, which is nearing completion.

* * *

It has been announced recently that **Dr. Dan W. Huebert,** Hutchinson, has been certified as a specialist in surgery by the American Board of Surgery, Philadelphia, Pennsylvania. Dr. Huebert thus becomes the first surgery specialist in the Hutchinson area and one of just a few in Minnesota not located in a metropolitan area.

* * *

Published in a recent issue of *The Journal Lancet,* regional medical publication, were the memories of almost a half-century in the surgery of bones and joints, by **Dr. Ralph K. Ghormley,** emeritus head of the Sections of Orthopedic Surgery in the Mayo Foundation.

* * *

Dr. Morton Roan, Ellendale, is hospitalized at Abbott Hospital, Minneapolis, suffering with acute nephritis. He was stricken recently in Minneapolis and ordered to the hospital for treatment.

* * *

Dr. Giles A. Koelsche, a consultant in medicine at the Mayo Clinic and a specialist in allergies, was named president-elect of the American College of Allergists recently at the college's Fifteenth Annual Congress in San Francisco.

* * *

Temporary officers of the Eveleth-Fitzgerald Community Hospital were named at a meeting held recently. They include **Dr. Frank R. Kotchevar,** Eveleth, president and **Dr. John L. Bonner,** Virginia, secretary. Also attending the meeting were **Drs. David J. Richter, M. Thomas Summar, Raymond J. Chittum, Thomas J. Gerend, Richard Payne, George Ewens, John L. Bonner, J. A. Malmstrom, C. S. Blackmore, R. W. Anderson, Matthew Wier, Whitney Woodroff, Isaac Prlina, A. M. Antonow, Paul Reed,** and **Richard E. Student,** all of the East Range Clinic; **Drs. Joseph Callan, W. S. Neff, D. R. Nelimark** and **David A. Sher,** all of the Lenont-Peterson Clinic, and **Drs. Joffry, E. R. Addy,** and **C. E. Goodman.**

* * *

Dr. Owen H. Wangensteen, University Hospitals, was among four University doctors who have successfully used dime-store balloons for stopping stomach hemorrhaging. A report of this treatment recently appeared in an issue of the *Journal of the American Medical Association.*

Drs. R. P. Pearsall, Virginia; **W. C. Heiam,** Cook; **F. R. Kotchevar,** Eveleth; and **E. R. Addy,** Gilbert, were among five Minnesota doctors recently presented with certificates of appreciation and fifteen-year pins for their service to Selective Service. Col. Murley A. Reep, State Director of Selective Service for Minnesota presented the awards.

* * *

Recent participants in the Second International Symposium of the Myasthenia Gravis Foundation in Los Angeles were three Mayo Clinic staff men, **Drs. Edward H. Lambert, E. Douglas Rooke** and **Donald W. Mudler.**

* * *

Dr. Robert G. Tinkham, Minneapolis, was elected Chief-of-Staff of St. Barnabas Hospital, Minneapolis, at the annual meeting of the Medical Staff. He succeeds **Dr. Edgar A. Webb.** Vice Chief-of-Staff is **Dr. Mancel T. Mitchell, Dr. Donald G. Bohn** was re-elected Secretary-Treasurer. Elected as Section Chiefs were: **Dr. Paul J. Bilka,** Medicine; **Dr. U. S. Anderson,** General Surgery; **Dr. John T. Moehn,** Obstetrics and Gynecology; **Dr. A. V. Stoesser,** Pediatrics; **Dr. N. H. Lufkin,** Pathology; **Dr. Archie M. Smith,** General Practice; **Dr. Carl J. Olson,** General Practice, and **Dr. Charles A. Aling,** General Practice.

Dr. C. Gordon Watson, Minneapolis, has become Chief of Staff of Fairview Hospital for the coming year. He succeeds **Dr. Harry B. Hall.** Named Chief-elect was **Dr. Lester W. Carlander, Jr.** Other medical officers are **Dr. George Martin,** secretary, and **Dr. Gordon W. Strom,** treasurer.

* * *

Four Mayo Clinic doctors participated in meetings of the International Academy of Pathology and the American Association of Pathologists and Bacteriologists at Boston recently. The doctors were **Dr. Jesse E. Edwards,** staff member of the Clinic's Section of Pathology; **Dr. Edith M. Parkhill,** consultant in Surgical Pathology at the Clinic; **Dr. Edward L. Segal,** a Fellow in Clinical Pathology, and **Dr. Grier F. Starr,** former member of the staff in Surgical Pathology, now in private practice in Eugene, Oregon.

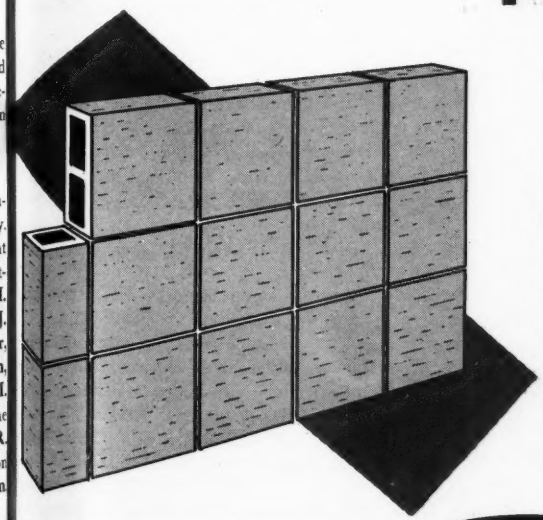
* * *

Dr. B. Marden Black, Section of Surgery, Mayo Clinic, served as chairman of the committee in charge of Clinical Reviews, a three-day program for general practitioners of medicine offered each year by the Mayo Clinic. Assisting Dr. Black were **Dr. David T. Carr** and **Dr. Edwin D. Bayrd,** Section of Medicine; and **Dr. A. B. Hayles,** Section of Pediatrics.

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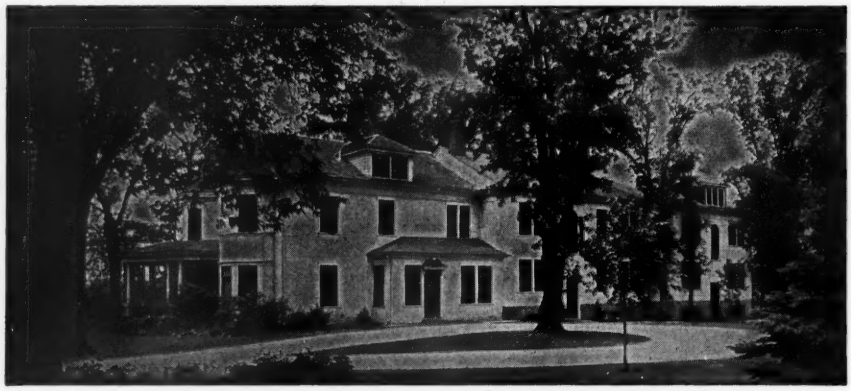
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*Medical Economics, Feb. 2, 1959.

Dr. Wesley W. Spink, University of Minnesota professor of medicine, was elected first vice president of the American College of Physicians at the organization's annual meeting in Chicago, April 23, 1959.

A governor in the college, representing the State of Minnesota for the last nine years, Dr. Spink also was elected to the college's Board of Regents. More than 200 Minnesota doctors are members of the American College of Physicians which is comprised of more than 10,000 specialists in internal medicine in the United States, Canada and Puerto Rico.

* * *

Members of the Minnesota State Medical Association who participated in the first statewide Cardiac-in-Industry Conference held recently in Minneapolis include the following: **Dr. John F. Shronts,** Medical Director of General Mills who was chairman of the program planning committee; **Dr. Arthur G. Kerkhof,** Medical Director, *Minneapolis Star-Tribune,* who extended the conference welcome; **Dr. G. R. Diessner,** Medical Consultant to IBM Medical Department, who spoke on "The Heart of the Problem"; **Dr. John F. Briggs,** St. Paul Internist, who took part in the same discussion; **Dr. Tracey E. Barber,** Hormel Company, Austin, who spoke on "Industrial Physician's Viewpoint"; **Dr. Karl W. Anderson,** President of the Minnesota Heart Association, who acted as toastmaster for the evening; and **Dr. R. S. Ylvisaker,** President of the Hennepin County Medical Society, who presented greetings.

Book Reviews

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

NOW OR NEVER—The Promise of the Middle Years. Smiley Blanton, M.D. Diplomate of the American Board of Psychiatry and Neurology; Associate Founder and Director of the American Foundation of Religion and Psychiatry, and Director of the Religo-Psychiatric Clinic of the Marble Collegiate Church. With Arthur Gordon. 273 pages. Price $4.75, cloth. New York: Prentice-Hall, Inc., 1959.

CANCER: Diagnosis and Treatment. John B. Field, University of Southern California, Los Angeles. Price $18.50. Boston: Little, Brown & Co., 1959.

MATERNITY—A Guide to Prospective Motherhood. Frederick W. Goodrich, Jr., M.D. 130 pages. Illus. Price $1.75, cloth. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1959.

TEXTBOOK OF SURGERY. Third Edition. Edited by H. Fred Moseley, M.A., D.M., M.Ch. (Oxford), F.A.C.S., F.R.C.S. (Eng.), F.R.C.S. (C). Assistant Professor of Surgery, McGill University; Associate Surgeon, Royal Victoria Hospital, Montreal, Canada. 1336 pages. Illus. Price $17.00, cloth. St. Louis: C. V. Mosby Co., 1959.

A DOCTOR DISCUSSES MENOPAUSE. G. Lombard Kelly, A.B., B.S. Med., M.D. President Emeritus and formerly Professor of Anatomy, Medical College of Georgia; formerly Research Associate in Anatomy, Cornell University Medical School; member American Association of Anatomists; contributor to scientific journals in the fields of physiology and endocrinology. 90 pages. Illus. Price $1.50, paper cover. Chicago: The Budlong Press, 1959.

SURGICAL PATHOLOGY, Second Edition. Lauren V. Ackerman, M.D. Professor of Surgical Pathology and Pathology, Washington University School of Medicine, Saint Louis, Missouri; Surgical Pathologists, Barnes Hospital and Affiliated Hospitals, St. Louis; consultant to the Armed Forces Institute of Pathology. In collaboration with Harvey R. Butcher, Jr., M.D. Associate Professor of Surgery, Washington University School of Medicine, Saint Louis. 1096 pages. Illus. Price $15.00, cloth. St. Louis: C. V. Mosby Co., 1959.

THERAPEUTIC RADIOLOGY—Rationale, Technique, Results. William T. Moss, M.D. Assistant Professor of Radiology, Northwestern University School of Medicine, Department of Radiology, Chicago; Director Department of Therapeutic Radiology, Chicago Wesley Memorial Hospital; Chief, Department of Therapeutic Radiology, Veterans Administration Research Hospital, Chicago. 403 pages. Illus. Price $12.50, cloth. St. Louis: C. V. Mosby Co., 1959.

TUMORS OF THE LUNGS AND MEDIASTINUM. By B. M. Fried, M.D., F.C.C.P. Associate Attending Physician, Montefiore Hospital; Associate Visiting Physician, Morrisania City Hospital, New York, New York.

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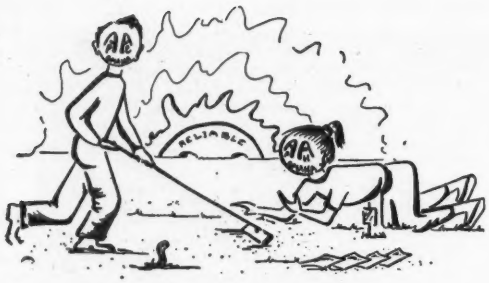
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(467 pages, 340 illustrations, 231 figures, and 4 in color on 2 plates.) Philadelphia: Lea and Febiger, 1958. Price, $13.50.

This excellent work deals with the histogenesis, etiology, clinical manifestations, diagnosis, differential diagnosis, and therapy of virtually all tumors, benign or malignant of the lungs, pleura, and mediastinum. Many carefully chosen case histories with roentgen studies and photomicrographs of histological material illustrate both common and uncommon manifestations of tumors in the thoracic area.

Carcinoma of the lung is discussed in greatest detail, emphasis being placed on the early clinical manifestations of the disease. Two chapters devoted to the etiology of carcinoma of the lung are an excellent review and concise summary of recent experimental and clinical work.

There are separate chapters devoted to diagnostic procedures, radiology, pulmonary function, surgical treatment, and radiotherapy in connection with carcinoma of the lung which relate the uses and relative importance of these to the therapy of a given patient. Adenoma and rare tumors of the lungs and mediastinum, including tumors of lymphoid tissue, tumors of the thymus gland, terato-dermoids, neurogenic tumors and cysts are considered individually and completely.

Interesting historical references appear throughout this work and a well organized bibliography appears at the end of each chapter.

This comprehensive, well-written text of tumors of the lungs and mediastinum is recommended by this reviewer to all physicians—internists, as well as general practitioners, thoracic surgeons, chest specialists, and radiologists.

LLOYD D. MACLEAN, M.D.

THE PLASMA PROTEINS. CLINICAL SIGNIFICANCE. By Paul G. Weil, B.A., M.D.C.M., M.Sc., Ph.D. Director, Transfusion Service and Assistant Physician, Royal Victoria Hospital; Lecturer in Medicine, McGill University; Consultant in Medicine, Queen Mary Veterans and Grace Dart Hospitals; Consultant in Tranfusion, Queen Elizabeth and Royal Edward Laurentian Hospitals. 133 pages. Price, $3.50, cloth. Philadelphia: J. B. Lippincott Company, 1958, 1959.

This small monograph presents a brief, yet excellent review of plasma proteins as related to clinical practice. The author has satisfactorily succeeded in correlating the various abnormal states of the plasma proteins as reflected by diseases such as liver disease, neoplastic diseases, hemorrhagic disorders, metabolic derangements and auto-immuno hypersensitivity diseases.

A statement in the text that Bence Jones protein of the urine in multiple myeloma is probably the same as the abnormal globulin in the plasma is not in agreement with recent isotopic investigations. This fraction is a nitrogenous compound that is independently produced and the Bence Jones protein is unrelated to the circulating globulin of multiple myeloma.

This small text gives a brief review of the plasma proteins in normal and disease states. It is recommended to all students of medicine.

D. S. AMATUZIO, M.D.

Surgery of the Lymphatics in Cancer of the Rectum and Sigmoid Colon

LLOYD F. SHERMAN, M.D.
ROBERT J. TENNER, M.D.
Minneapolis, Minnesota

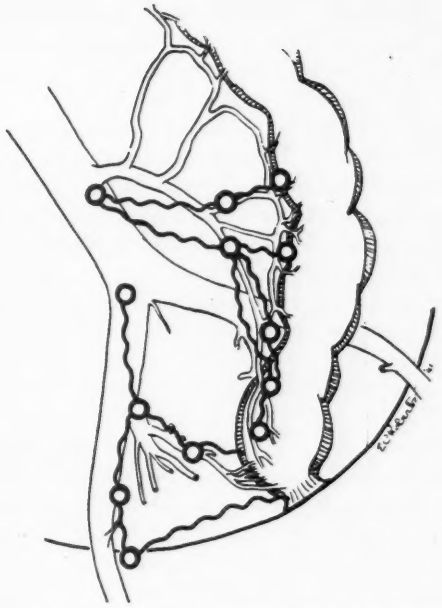


Fig. 1. Scheme of lymphatic drainage of the rectum and sigmoid colon.

Inaugural thesis presented by Lloyd F. Sherman, M.D., before the Minneapolis Surgical Society, May, 1958.

AS LONG AS surgery offers the only consistent method of curing cancer of the rectum and colon, those who assume that responsibility must be constantly on the alert for newer concepts to improve their survival rates. According to the Bureau of Vital Statistics, less than 30 per cent of the patients with rectal cancer operated in this country survive five or more years. This is hard to believe when some clinics report over 60 per cent five-year survivals. Partial blame for this low national survival figure, I am sure, is due to the patient's reluctance to seek earlier medical care, plus the lack of complete examinations once the care is sought. The greatest deterrent to increased survivals, however, is the reluctance of many operating surgeons to extend their lymph node dissections to cover all the possible avenues of lymphatic metastases.

During the past decade, a truly great contribution toward improved technique of cancer extirpation has been made by several workers (Fisher and Turnbull,[1] Pomeranz and Garlock,[2] Lloyd-Davies,[3] Abel,[4] Goligher[5] and Cole[6-8]) who formulated the concept of "cancer isolation." Extended resections can be of little value if these recently emphasized techniques of how cancer is approached and removed are disregarded.

Assumed that the operating surgeon is mindful of "cancer isolation" techniques, he may next gain more fruitful rewards by diverting his attentions toward the complete extirpation of all the possible avenues of lymphatic drainage of metastatic cancer of the involved segment of bowel. These have been described in the literature for the past fifty years, but little heeded until recently.[9] This is not a plea for ultraradical surgery, but rather a reminder that a thorough knowledge of the lymphatic drainage of the rectum and sigmoid colon is mandatory before one is qualified to select the most effective operation for cancers at various levels of this portion of the colon; and particularly since approximately 60 per cent of the patients presenting themselves for surgery, according to Coller, Kay and McIntyre,[10] Gilchrist and David,[11,12] Grinnell and Hiatt,[13] already have lymph node metastases (Fig. 1).

Moynihan,[14] in 1908, made the significant and often-quoted statement that, "Surgery of malignant disease is not a surgery of organs; it is the anatomy of the lymphatic system." Nowhere is this more applicable than to malignant disease of the rectum and colon. Since the introduction of the classical abdomenoperineal excision by Miles[15] in 1908, this operation has become established in many countries as (1) the standard operative procedure for removing rectal cancer and (2) the standard by which all other operative procedures are judged. However, one must not forget that the Miles procedure was introduced as a more adequate operation than the existing perineal-sacral methods of excision. It was indeed a more adequate operation, but in the same year (1908) Moynihan presented evidence that the lymphatic metastases which may be present at the aortic origin of the inferior mesenteric artery would not be removed by the Miles technique. This challenge to the adequacy of the Miles technique has remained unheeded until recently.

The original investigations of Miles[15] described three directions or avenues of lymphatic spread of cancer of the rectum and distal sigmoid colon, namely, the upward or superior avenue of metastases along the course of the superior hemorrhoidal vessels, the lateral avenue of spread eventually terminating in the iliac lymphatics, and the downward or retrograde avenue of spread below the level of the tumor.

It is the purpose of this paper to report several variations from the original investigative work of Miles,[15] that are documented in the recent literature and to report our observations in the lymphatic spread of rectal and sigmoid cancer which can be demonstrated with the *in vivo* injections of a vital dye* (Fig. 2).

The Superior Zone of Spread.—This represents the most frequent avenue of lymphatic metastases for cancer of the rectum and distal sigmoid colon. The superior lymphatic area of the rectum comprises those tissues containing the lymphatic channels and nodes which follow the superior hemorrhoidal vessels forming the superior pedicle of the rectum. The channels of this pedicle are most frequently satellites of the arteries and usually comprise two lymphatic channels for each artery. After perforating the muscular coat of the rectum, these lymphatics run upward and backward to reach the glands of the mesorectum. They traverse the pararectal nodes of Gerota, which vary from four to seven, are placed on the muscular layer and are covered by the fibrous coat of the rectum. They are encountered especially above the region of the ampulla and the lowest of them is situated immediately above the *Levators ani.* Glands of very minute size, unless some pathologic reason for their enlargement is present, are encountered along the superior hemorrhoidal vessels above the area described. In the mesosigmoid, above the minute glands, other glands of considerable size are grouped around the trunk of the superior hemorrhoidal artery.

Gerota,[16] and Poirier, Cuneo and Delamere[17] demonstrated that the rectum is divided into two distinct networks of lymphatic origin. Gerota differentiated a superior and an inferior lymphatic region in the rectum. The superior is composed of a close network of lymphatics and the inferior is made up of longitudinal bands of lymphatics disposed in a columnar form along the columns of Morgagni, representing the upper limits of that area (Fig. 3).

A more convincing demonstration that the rectum is divided into two different areas was made by Villemin, Huard and Montagné.[18] From this illustration (Fig. 3) it becomes clear that the rectum is divided into two different areas of spread, one below and the other above the middle valve of Houston (Kohlrasch's Plica). The upper rectum is drained exclusively through the superior pedicle while the lower portion of the rectum is drained by all three pedicles.

Villemin, Huard and Montagné described three different groups of nodes of the mesorectum:

1. One group is located at the bifurcation of the superior hemorrhoidal artery. These nodes received many short channels from the rectum and anus and are called the rectal group. These are the most important and common group of nodes of the rectum and for that reason Mondor called this area the hilus of the rectum.

2. Another group of nodes is found at the junction of the sigmoidal arteries with the superior hemorrhoidal. They receive the channels from the rectum and sigmoid and are called the rectosigmoidal group. These channels are usually the continuation of the channels of the previous group

*Injectable Sky Blue with Hyaluronidase-Wyeth.

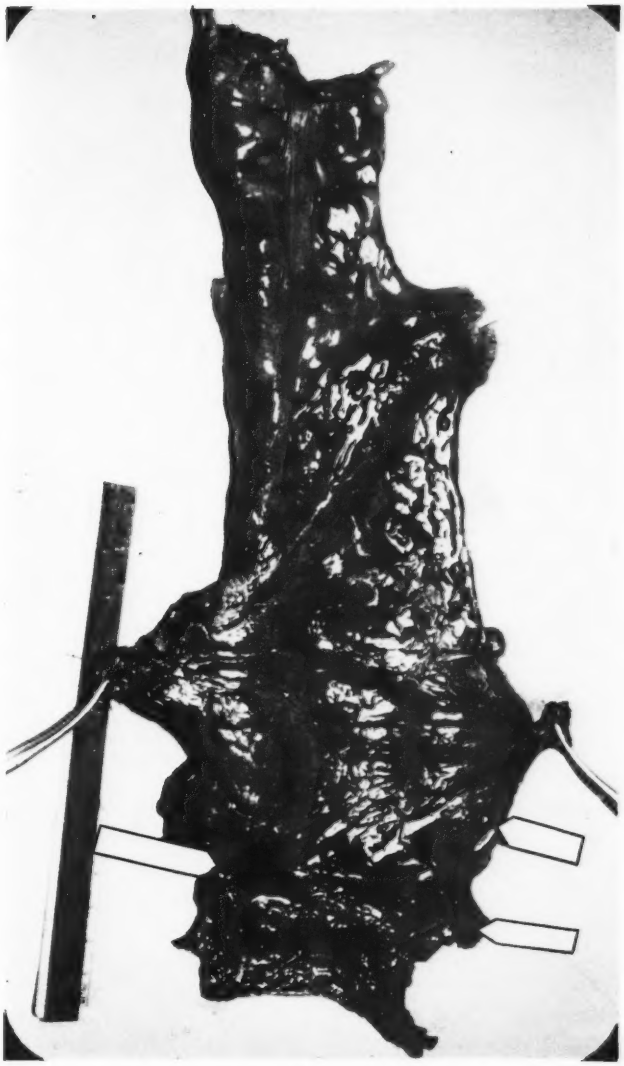


Fig. 2. Serosal view of sigmoid colon and rectum: Direct Sky Blue dye, 4 per cent, with hyaluronidase (Wyeth) was injected submucosally below an annular lesion at 5 centimeters. The dye has spread in all three directions of lymphatic drainage: superiorly, laterally and retrograde. (Lower arrow points to retracted stumps of levator muscle, upper right hand arrow points to a stained lymph node in the lateral ligament, hemastats mark the lateral ligaments, the avenues of lateral lymphatic spread of rectal cancer.)

though in some instances some channels of medium length reach these nodes without traversing the anterior group.

3. A third group of nodes is located where the inferior mesenteric artery gives origin to the left colic artery and the first sigmoidal artery. This group is called rectosigmoidal colic because it receives the lymph from the rectum, sigmoid and descending colon. The channels connecting this group are derived from the previous group of channels but there may be some channels of great length extending directly from the rectum without traversing the other groups. These channels are called the long channels and they may be accounted for by a variation from the orderly pattern described by Gilchrist and David, which is the common pattern encountered in the evolution of metastases to the nodes. Indeed, cancer cells may be drained from the lower rectum directly to the upper group of nodes without traveling through the other groups. This makes it possible to explain why McVay,[19] Gabriel, Dukes and Bussey[20] encountered the orderly spread described by Gilchrist and David in most of their cases, though in a few instances, one or two involved nodes were present well above the nodes in the proximity of the tumor.

It is the current consensus that the superior zone of lymphatic spread should be ligated as high as possible in resecting rectal and sigmoid cancers. Moynihan[14] pointed this out in 1908, but it remained for Ault[21,22] and his associates in 1950, to alert us to the inadequacy of superior ligations.

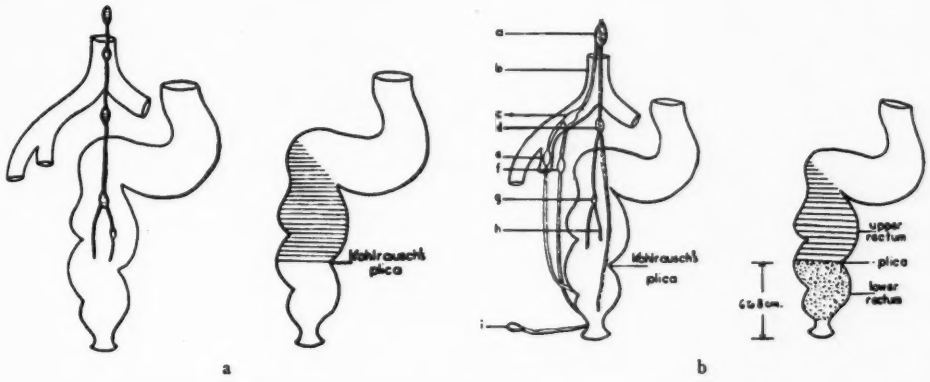


Fig. 3. *(a)* Injection of a blue dye above the plica of Kohlrausch. The lymphatic network of the upper rectum is colored by the dye and the lymphatics accompanying the superior hemorrhoidal veins are the only ones to become colored by the dye. (Modified from Villemin, Huard and Montagné: Rev. de Chir., 63:39, 1925.)

(b) A yellow dye was injected into the rectum below the plica and a blue one above. It is clearly shown that the rectum has two distinct lymphatic networks and that the plica is the limit between them. The inferior and lateral trunks drain only the lower rectum while the superior pedicle drains the upper and lower rectum. (Modified from Villemin, Huard and Montagné: Rev. de Chir., 63:39, 1925.)

They presented evidence that an additional two inches or more of gland-bearing vascular lymphatic tissue could be removed with a specimen of left colon or rectal cancer if extirpation of the inferior mesenteric artery was done at its aortic origin instead of removing it at the level of ligation suggested by Miles. Apparently fear of "Sudek's Critical Point" has deterred many surgeons from a more radical interruption of the superior zone of spread prior to this report. Ault[22] pointed out that Sudek was concerned with the perineal removal of the rectum in that his precautions are in no way valid as concerns the intra-abdominal ligation of the mesosigmoid with an abdominoperineal or anterior resection and that the whole false entity should be forgotten.

Extended dissections with high ligation of the inferior mesenteric artery have demonstrated that the instance of cancerous intramesenteric lymph nodes, located between the aortic origin of the inferior mesenteric artery and the Miles level of ligation may exceed 15 per cent. Grinnell and Hiatt[13] reported an instance of 17 per cent in 1952. Rossi[23] demonstrated positive nodes in 14 to 22 per cent of patients in 1954. McElwain and Ba-

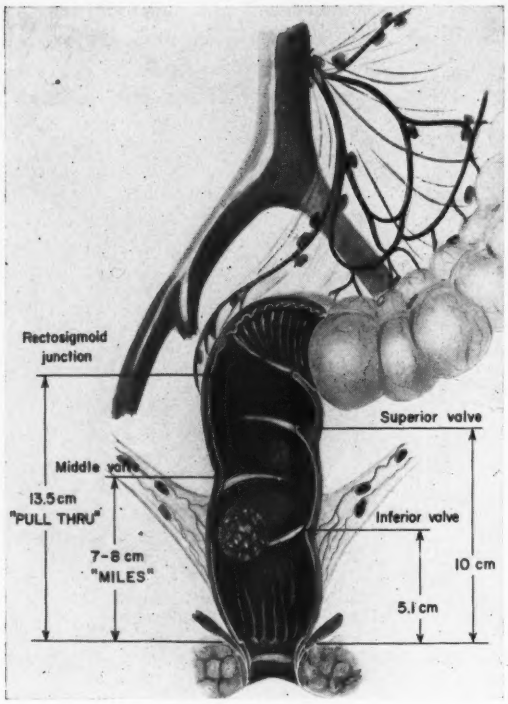


Fig. 4. Lymphatic drainage of rectum and sigmoid colon (L. F. Sherman).

con[24] reported 17.8 per cent of ninety patients to have had positive inferior mesenteric nodes at the time of resection (Fig. 4).

The Lateral Zone of Spread.—The lateral or middle area of the rectum has three main pedicles: A posterior, the lateral and the anterior.

The Posterior Pedicle: The efferents of this pedicle accompany the lateral or middle sacral vessels. The middle sacral channels cross one or more nodes. Because of their location they are called the nodes of the promontory. The lateral sacral nodes generally are located between the common iliac and the sacrum just below the origin of the internal iliac artery.

The Lateral Pedicle: This pedicle is formed by the lymphatics which follow the middle hemorrhoidal artery. These efferents constitute the most important pathway for metastasis to the lateral area of spread and are second only in importance to the superior pedicle for the drainage of the entire rectum.

The importance of these lymphatics has been underestimated owing to the fact that all emphasis was placed on the excision of the levators as the approach for the excision of these channels. The lateral lymph channels and nodes are contained in the lateral rectal stalks, some distance above the levators. The levators contain muscular lymphatics of local importance but cannot be considered as the site of the lateral lymphatic drainage of the rectum, as was originally postulated by Miles.[15] This is well substantiated by the work of Wood and Wilkie,[25] of Dukes[26] and of Guernsey, Waugh and Dockerty,[27] who showed the levators not as a site for lateral metastases but rather subject to direct tumor extension.

Sauer and Bacon[28,29] have recently stimulated our thinking in regard to the lateral zone of spread of cancer of the distal rectum by the use of vital dyes injected, *in vivo,* preoperatively. They were able to demonstrate that dye injected below Kohlrausch's plica (middle valve of Houston) stained the lymph nodes of the lateral pedicles but dye injected above this level was picked up by only the nodes of the superior pedicle. They further emphasized that the zone of lateral lymphatic spread was confined to the lateral rectal stalk some distance proximal and lateral to the levators and the most radical excision of the levators would in no way suffice to eradicate these tissues. Sauer and Bacon reported thirty-two complementary pelvic lymph node dissections for rectal cancers. Ten lesions located above the middle valve of Houston had no evidence of lateral spread. Twenty-two cases where the lesion was located below the middle valve of Houston and of these, six had metastatic nodes along the lateral zone of spread. They recommended complementary pelvic lymph node dissections, in addition to abdominoperineal resection for cancers below the middle valve of Houston.

During the past eight years we have engaged in similar studies to convince ourselves of the true nature and instance of the lateral lymphatic spread of cancer of the distal rectum. A vital dye (Injectable Sky-Blue with Hyaluronidase-Wyeth) was injected preoperatively in thirty patients. One-half of one cubic centimeter was injected submucosally just proximal to the pectinate line in four wheels above the anal mucosa. The dye at the time of surgery was found to stain the nodes of the superior, as well as the lateral pedicles, when it was injected below the middle valve of Houston. Thirty patients were submitted to pelvic

lymph node dissections and six (20 per cent) were found to have positive lymph nodes along the course of lateral spread. One patient had metastasis involving an obturator lymph node.

The most thorough and convincing study to appear in the literature in regard to the lateral zone of spread of rectal cancer was recently published by Freidin[30] of Australia. He testified that low rectal lesions have a poorer prognosis than those located above the middle valve of Houston due to the opportunity for additional direction of spread laterally, and he felt that this was the chief factor in the poorer prognosis.

Freidin[30] performed painstaking postoperative dissections on 100 cancers of the rectum produced by abdominoperineal resections. He ascertained that the superior and lateral vessels were two separate entities with no communication. The lymph channels and nodes accompanied these sets of vessels. In a number of specimens no lateral vessels could be found on either one or both sides although the lateral ligament was well developed or readily identifiable. Thirty-eight of the 100 dissections had no lateral vessels and accompanying lymph nodes. In these cases, the superior hemorrhoidal artery and veins completely replaced the lateral vessels by lower implantations on the rectal wall. This observation was correlated with the lack of bleeding from the cut ends of the lateral ligaments during surgery (Fig. 5).

No constant relation in level was found between the site of entry of the lateral vessels on one hand and the situation of the levators and the peritoneal reflection on the other. In other words, these three levels are independent entities, so that subdivision of neoplasms into supra and infraperitoneal groups or into groups dependent on the proximity of the tumor to the levators is, in either case, a fallacious concept since such subdivision may not coincide with the lateral fields. When lateral vessels were found, they occurred in more constant position than the peritoneal reflection; their level ranged from four to eight centimeters above the anal margin (Fig. 6).

The level of the peritoneal reflection varied greatly in this series. Taking the point of the anterior reflection, it ranged from 5 to 12 centimeters above the anal margin. Taking the lateral point of reflection on the right and the left lateral aspects of the rectal wall it ranged from 6 to 14 centimeters above the anal margin.

Freidin's[30] specimens were divided into three groups according to their level in relation to the lateral vessel field of spread:

1. Thirteen tumors are below the lateral fields.



Fig. 5. The superior and lateral rectal vessels are displayed (a black background has been introduced between the vessels and rectal wall). Note lymph nodes related to the right lateral vessels (Freidin).

Five showed lateral vessels and two had related lymph nodes involved by neoplasm.

2. Forty-eight tumors are situated at the lateral field level with lateral vessels in thirty-four, lymph nodes related to them in eighteen, ten of which were involved by neoplasm. In these two groups, lateral spread is shown to occur despite a superior avenue of spread which is either free of metastases

or contains only a small number of them. This contradicts the opinion expressed by all authors that lateral spread occurs only when the superior zone is blocked by metastases.

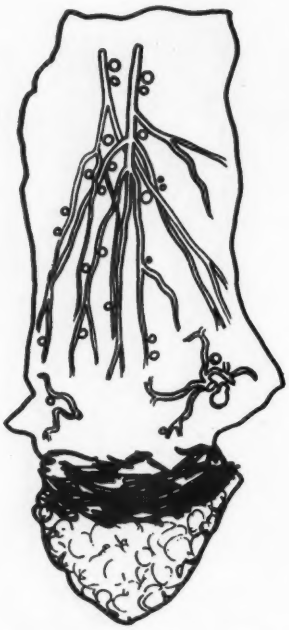


Fig. 6. Drawing showing the distribution of superior and lateral vessels of specimen shown in Figure 5 with the lymph nodes related to these vessels (Freidin).

3. In the third group of tumors situated above the lateral fields, twenty-three out of twenty-nine show lateral vessels, but only four had related lymph nodes, none of which is affected by malignancy.

The Anterior Pedicle: This pedicle is made up of two main groups of trunks, one on each side of the rectum. After leaving the rectum, it followed the rectourethralis muscle in an upward direction between the two layers of the rectogenital septum without perforating it. This septum (the rectovaginal in the female and Denonvillier's fascia in the male) is, according to Reinhold,[31] a barrier to the lymphatic penetration of the bladder, uterus and prostate. After reaching the rectogenital septum, the trunks turn upward until they reach the upper border of that fascia. They then deflect laterally, one on each side, and are directed toward the internal iliacs. Occasionally they fuse with the middle hemorrhoidal channels or with the lateral sacral trunks while in a few instances they connect with the external iliacs.

The superior and lateral zones of spread are by all means the most important avenues of metastases. They have and should receive the greatest considerations. Except for anterior and anterolateral cancers of the distal rectum in the female. Here there is great interchange of lymphatic drainage with the rectovaginal septum; making the excision of the posterior vaginal wall and uterus an indicated necessity where the cancers are situated in proximity. In the male, direct extension to involve the prostate or lymphatic invasion is a rarity.

Retograde Zone of Spread.—The literature is replete with evidence denying the probabilities of significant retrograde spread of cancer of the upper and mid-rectum. Glover and Waugh[32] presented convincing evidence that downward spread of rectal cancer occurred in no more than 1 per cent of the formalized specimens that they cleared, sectioned and measured. McVay,[19] Gabriel, Dukes and Bussey[20] and Grinnell[13] also showed that the retrograde spread of rectal cancer was much less extensive than reported by Miles, Gilchrist and David.[11,12,15] These investigators reported only one case with retrograde spread as far as 4 centimeters below the lesion.

In view of this overwhelming evidence against retrograde spread of rectal and rectosigmoid cancer, it would seem that one should be content to accept the available evidence and avoid further conjecture. That being the case, it would be difficult to explain the high incidence of recurrence following anterior resections for advanced cancers of the mid and upper rectum. Some clinics[33] have reported as high as 25 per cent recurrence following anterior resection for large lesions (presuming lymph node metastases) of the mid and upper rectum. Many surgeons[1,29] confess that they now limit their usage of anterior resection to early lesions (presuming negative lymph nodes) of the upper rectum and rectosigmoid, because of their high recurrence rates.

It is admitted that a certain number of recurrences following anterior resection can be blamed onto "seeding" of the anastomosis, coincident with manipulation of the lesion, and particularly since these lesions are more difficult to isolate than cancers higher in the colon. In 1951 Goligher[5]

and associates reported 10 per cent incidence of suture line implantation that occurred in sixteen of 152 patients who had sphincter-saving operations performed for cancer of the rectum and rectosigmoid.

Cole[7,8] similarly reported 10 per cent suture line recurrences in fifty-five patients. But with careful observation of "isolation technique" this percentage should be reduced to nil, yet, I am sure that a fairly high incidence of recurrence will prevail when advanced (Dukes "C") lesions of the mid and upper rectum are extirpated by anterior resections, and largely because lymph nodes involved with retrograde lymphatic metastases are left behind.

Two salient facts serve to convince us that retrograde metastases can occur more than as inconsequential rarities:

1. Vital dye can be forced retrograde to stain Gerota's nodes and nodes of the retrorectal lymphatic pedicle by obstructing its superior flow. Example: Specimens were obtained by two team synchronous abdominoperineal resections. The abdominal operator clamps the distal sigmoid and its mesentery; the perineal operator injects Direct Sky Blue dye, 4 per cent, with hyaluronidase *via* a proctoscope and a long tonsil needle submucosally just distal to the clamped bowel. Within fifteen minutes, the retrorectal pedicle and its nodes are stained in a retrograde fashion for a distance of 8 to 10 centimeters.

2. Postoperative dissections of fresh, non-formalized specimens have demonstrated several (six) with lymph nodes involved with cancer 6 to 8 centimeters below the lesions. All specimens have had superior node metastases, but they were not necessarily choked with metastases as has been suggested as a requisite.[32] All six patients were operable. A lymph-node cleaning project on fresh postoperative specimens is underway at this time, by the authors, in an attempt to either prove or disprove this thesis. Until that time, we will continue to resect lesions between the middle valve of Houston and 12 to 13 centimeters from the anal verge by "Pull-Thru" techniques, unless there is evidence of fixation and local extension.

Conclusions

1. A revived interest in the lymphatic drainage of the rectum and sigmoid colon is manifest in the literature during the past decade.

2. The superior zone of spread of cancer of the distal colon is the most frequently traversed by metastases. High inferior mesenteric artery ligation is mandatory. "Sudek's point" is now considered a myth. The rectum is divided into two distinct networks of lymphatic origin.

3. The importance of the lateral zone of spread has been underestimated because of misunderstanding of its anatomical location and consequent lack of excision even with wide removal of the levators. Studies using Direct Sky Blue dye demonstrate its course. Lateral spread occurs only with cancers located below the middle valve of Houston (Kohlrausch's plica). The closer the lesion to the lateral vessels, the more frequent the lateral metastases. Lateral spread may occur without superior blockage.

The peritoneal reflection is variable and is an inaccurate standard of measuring lesions. Operative procedures should be ascertained by the proctoscopic level of the lesion plus the usual criteria of operability.

4. The retrograde spread of rectal and sigmoid cancer is a reality, according to the authors. It usually occurs with superior blockage of lymphatic drainage and frequently enough to consider the resection of the entire rectum with its retrorectal lymphatic pedicle for lesions below 12 and 13 centimeters by either a Miles or "Pull-Thru" type of resection.

References

1. Fisher, E. R., and Turnbull, R. B.: The cytologic demonstration and significance of tumor cells in the mesenteric venous blood in patients with colorectal carcinoma. Surg., Gynec. & Obst., 100:102, 1955.
2. Pomeranz, A. A., and Garlock, J. H.: Postoperative recurrence of cancer of the colon due to desquamated malignant cells. J.A.M.A., 158:1434, 1955.
3. Lloyd-Davies, O. V.: Discussion on conservative resection in carcinoma of the rectum. Proc. Roy. Soc. Med., 43:706, 1950.
4. Abel, A. L.: Discussion on the treatment of advanced cancer of the rectum. Proc. Roy. Soc. Med., 43:1087, 1950.
5. Goligher, J. C., Dukes, C. E., and Bussey, H. J. R.: Local recurrence after sphincter saving excisions for carcinoma of the rectum and rectosigmoid. Brit. J. Surg., 39:199, 1951.
6. Cole, W. H.: Measures to combat the menace of cancer. Am. Surgeon, 19:660, 1951.
7. Cole, W. H.: Recurrence in carcinoma of the colon and proximal rectum following resection for carcinoma. A.M.A. Arch. Surg., 65:264, 1952.
8. Cole, W. H., Packard, D., and Southwick, H. W.: Carcinoma of the colon with special reference to prevention of recurrence. J.A.M.A., 155:1549, 1954.
9. McGrew, E. A., Laws, J. F., and Cole, W. H.: Free malignant cells in relation to recurrence of carcinoma of the colon. J.A.M.A., 154:1251, 1954.

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Postsurgical Fluid Balance

The author presents a correlation between the basic physiologic considerations of body water and electrolytes and the clinical management of the postsurgical patient. "W.A.S. triad" (weakness, anorexia, and silent abdomen) accompanies potassium deficiency in the body. Of all electrolyte replacement therapy, that which we employ for potassium deficiencies must be most carefully managed.

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Presented at the clinical session of the American Medical Association, Minneapolis, December 4, 1958.

THE BODY maintains an amazingly constant internal environment; this is known as homeostasis. To stabilize such uniformity of the fluid matrix of the body, the patient must be supplied with proper amounts of water, electrolytes and proteins. Marine organisms require a specific salty environment (sea water) to carry on their numerous complex vital chemical processes. The chemical composition of the extracellular fluid of man is practically the same as its sea-water prototype. In other words, man's oceanic environment is now internal instead of external. Numerous works have been written on this subject; however, some disagreement exists as to the type of solution and the exact amount of water and electrolytes necessary for the maintenance of homeostasis. Every postoperative patient must be supplied with adequate amounts of water, salt, proteins, carbohydrates and vitamins. Fats are still under investigation but may be available soon in a form safe for parenteral administration. Fats are rarely essential in the immediate postoperative care of the patient. Osmotic pressure of intracellular and extracellular body fluids is maintained by the shift of water and electrolytes across cell membranes. The chief cation of intracellular fluids is potassium, that of extracellular fluid is sodium. The kidneys play an all-important role in maintaining fluids and electrolytes at constant levels.

Water

This substance makes up about 70 per cent of the total body weight in the average normal adult. About 80 per cent of the body fluid is found in the cells, and the rest is extracellular (interstitial spaces and blood vessels). In obese patients the total body water may be less than 40 per cent; hence, such individuals do not tolerate fluid imbalance well. It is important to have a simple method of determining the patient's water needs and water balance. Usually this can be determined easily and quite accurately by utilizing the rule that the average patient must be given enough water to permit him to urinate between 750 and 1,000 cc. per day. Some authorities prefer to calculate the water and electrolyte needs by determining the number of milliliters necessary per meter of body surface. Body surface area determinations are made from the so-called nomogram, using height and weight. Numerous factors, such as excessive perspiration, diarrhea, respiratory rate, drains, fistulas and nasogastric siphonage, alter the urinary output and water needs; these require individual correction.

It has been stated that the daily amount of water ingested in food is approximately 1,500 cc. An additional 5,500 cc. of water or potential water enters the esophagogastric-intestinal tract per twenty-four hours as: saliva 500 cc., gastric juice

1,200 cc., bile 600 cc., pancreatic juice 1,200 cc. and succus entericus 2,000 cc. This constitutes a total of 8,000 cc., which is 11 per cent of the body weight and over half of the extracellular water. Not all of this is present in the gastrointestinal tract at a given time. Water absorption most likely begins in the upper small bowel and continues to and through the right half of the colon; normally, only 200 cc. in excreted in the feces. It is dangerous to state unequivocally that every postoperative patient must have three quarts of fluid per day or continuous intravenous drip. The average patient will urinate approximately 750 cc. of urine daily if 2,000 cc. of water is supplied. These rules do not pertain to the nephritic or the cardiac patient. If the physician wishes to determine rapidly the state of hydration of a given patient, he may test the specific gravity of the urine. Another method is to catheterize the patient and determine the amount of urine he puts out in one minute. A properly hydrated patient will void ten drops of urine per minute. Clinical signs of dehydration should be detected easily. They are thirst, dryness of the tongue, sunken eyeballs and the loss of tissue turgor.

Primary Water Depletion

In primary water depletion (esophageal obstruction, coma, et cetera), the extracellular fluid becomes hypertonic, causing water to move from the cell to the extracellular space. Although the resulting intracellular dehydration may be marked, there may be no change in plasma volume or electrolyte concentration. Therefore, in this condition there is a small urinary output and normal or increased concentration of plasma, protein and/or electrolytes. The treatment of primary water loss consists of water replacement. This is accomplished best by the administration of adequate amounts of 5 per cent dextrose in water. Since relatively small amounts of salt have been lost, hypotonic saline or amino acid solutions containing a little sodium chloride are most desirable. The average postoperative patient requires 1 liter of water to replace insensible loss (breathing and sweating) plus 1 liter for urinary output. Approximately 4 gm. (69 mEq.) of sodium chloride will usually replace the daily salt. Less salt and water are required the first twenty-four postoperative hours because of the stress response to surgery.

Sodium Chloride

Sodium chloride (salt) requirements of the average individual range between 4 and 12 gm. (69 to 208 mEq.) daily. Such requirements are altered by weather, heat, fever, suction, vomiting and fistulas, to mention only a few conditions. The terms "normal saline" or "physiologic solution of sodium chloride" refer to a 0.9 per cent solution. Such a solution is actually unphysiologic; hence, it should be referred to as an isotonic solution of sodium chloride.

An isotonic solution of sodium chloride contains 154 mEq. of sodium per liter. The sodium content of extracellular fluid is 142 mEq. per liter. Therefore, the sodium content of an isotonic solution of sodium chloride is 12 mEq. per liter greater than the sodium content of extracellular fluid. Although this may not be the ideal relationship, it is not harmful. The chloride content of extracellular fluid is 103 mEq. per liter as compared with 154 mEq. of chloride per liter of isotonic sodium chloride. This means an excess of 51 mEq. of chloride per liter of isotonic solution. Such a discrepancy places a load upon the kidneys which must maintain a constant electrolyte balance of the extracellular fluid. These 51 mEq. of excess chlorides and 12 mEq. of excess sodium per liter must be excreted. If the kidneys are impaired, such a load (particularly the chloride) may become serious or even lethal. Excesses of chloride may also disturb seriously the acid-base equilibrium of the body. There are 9 gm. of sodium chloride in each liter of isotonic salt solution. The administration of 2 or 3 such liters daily places 18 or 27 gm. of salt, respectively, into the body, results in tissue edema, dehiscence of suture lines, delay of healing and/or possibly death. However, if a patient is in negative sodium balance, then it may become necessary to administer more than 9 gm. It is at a time such as this that flame photometric readings and electrolyte determinations become necessary.

Primary Salt Depletion

Primary salt depletion is more common than primary water depletion. The most common causes are vomiting, gastric suction, intestinal obstruction, diarrhea and intestinal tract fistulas. In this condition the extracellular fluid becomes hypotonic. The kidneys attempt to combat this hypotonicity by excreting large amounts of urine and no salt;

the kidneys cannot retain water in the absence of salt; hence, further water depletion also occurs, even if large amounts are supplied. The plasma chloride concentration may remain normal until the kidneys can no longer excrete the extracellular water. Obliguria or anuria may precede the appearance of clinical shock. In primary salt depletion, the plasma reflects the changes in chloride or bicarbonate concentrations, depending upon which body fluid is lost. The loss of gastric juice produces a reduction of plasma chloride (normal 100 mEq.) and an elevation of bicarbonate ion concentration (above 30 mEq.). There may also be a small drop in plasma sodium. These patients develop alkalosis. When the loss is due to bile or pancreatic juice, there is a greater loss of sodium bicarbonate than sodium chloride. The plasma bicarbonate is reduced below 25 mEq. and there might be a slight increase in plasma chloride. These patients develop acidosis. The treatment for primary salt loss will vary accordingly to the source of such loss. In general, however, one may follow this plan:

1. Hypotonic salt solutions (0.45 per cent) should be used in the immediate postoperative period because of fluid and salt retention (steroid action).
2. Isotonic solutions of sodium chloride (0.9 per cent) as a general replacement should be used primarily when gastric juice is lost. It must be recalled that gastric juice is often hypotonic; hence, replacement of such drainage contents by the "volume for volume" rule is not always accurate; it requires re-evaluation if such loss is prolonged.
3. Hypertonic solutions of sodium chloride (2 to 5 per cent) are preferred in patients with pancreatic or intestinal fistulas because of the great salt loss. To attempt to compensate for such heavy salt losses with isotonic salt solutions would result in an excessive urinary output. Continuous and daily re-evaluation of these cases will determine the necessary requirements.

Potassium

This cation is chiefly intracellular. The exact daily requirement is not known; however, it has been estimated that the average adult requires from 2 to 4 gm. (51 to 102 mEq.). The primary causes of potassium deficiency include vomiting, diarrhea, pyloric obstruction, ulcerative colitis, intestinal fistulas, prolonged administration of ACTH or cortisone and continued usage of potassium-free solutions. Overproduction of ACTH endogenously may result from diabetic acidosis. Potassium deficit may also result from increased body utilization of potassium as occurs during the healing of burns. Clinical findings of this deficit are characterized by a triad which includes weakness, anorexia and silent abdomen, which the author calls the W.A.S. triad. If cells are deprived of potassium, they cannot function properly; this refers particularly to muscle cells (gastrointestinal and cardiac). When a patient is in negative potassium balance, the cells become depleted of this ion; sodium which exists mainly as an extracellular ion attempts to replace the lost potassium and becomes intracellular. Water follows the sodium into the cell with a resulting cellular edema. Swollen cells cannot function properly, this being particularly true of the mass of muscle cells. Hence, we find electrocardiographic changes and distended bowel. Palpable muscles feel soft and putty-like; and if the condition continues untreated, extreme weakness, tremors and coma result. Electrocardiographic findings of low voltage and flattening of the T waves are present when the potassium level is below 4 mEq. The plasma potassium may be normal or even increased in an early cellular potassium deficit; hence, the plasma level does not always reflect the true cellular potassium status. If alkalosis persists after adequate sodium chloride therapy and hydration, one must suspect a potassium deficit.

When sodium and potassium are being lost, the normal kidney conserves the sodium by almost total tubular reabsorption; the urine contains practically no sodium. Unfortunately, such a safety valve does not exist for the conservation of potassium. Even in conditions of severe potassium deficit this cation continues to be lost in the urine.

The treatment of potassium loss requires careful replacement. Since excessive potassium may produce a heart block and sudden death, it must be administered cautiously. It is usually contraindicated in cases of severe oliguria or anuria because of a potassium "pile-up." In emergency treatment from 4 to 5 gm. of potassium chloride should be given in 1 liter of 5 per cent dextrose and water. After this, 3 gm. of parenteral potassium chloride is usually necessary to maintain daily requirements. Oral administration of potassium chloride should be instituted as early as possible (5 to 10 gm.) daily for many days because the depletion is difficult to overcome. The reason for this is that the homeo-

static mechanism of the body attempts to prevent extracellular potassium from going above a level of 5.5 mEq. per liter.

Protein Requirements

The protein requirements for the average adult vary, depending upon the amount of physical energy expended, but have been calculated as being approximately 100 gm. per day. The protein needs of the desk worker are much less than those of the physical laborer. However, at bedrest, the average postoperative patient will not tear down his own proteins if we supply this minimum of 100 gm. per twenty-four hours. If the patient cannot take this per month, it must be supplied parenterally in blood, plasma, or one of the more modern solutions (hydrolasates) which supply the amino acids.

Carbohydrate Requirements

Carbohydrates also should be supplied in the amount of 100 gm. per day; again, this figure varies. This is administered in the form of 5 per cent dextrose. The diabetic patient must also have his proper daily allotment, but this must be covered with insulin. Such special cases should be managed by a physician well versed in diabetes.

Vitamins

Fat-soluble vitamins A and D usually are stored in the body, but the water-soluble vitamins B and C are depleted rapidly and require replacement. Vitamin B is necessary for the proper utilization of proteins; hence, it is advisable to give from two to three ampules of vitamin B complex per day. Vitamin C has been aptly referred to as the surgeon's vitamin, since it is essential for wound healing. If this vitamin is deficient, small petechial hemorrhages occur and interfere with proper healing. The author has found it advantageous to supply 1,500 mg. of cevitamic acid per day.

Some pharmaceutical houses, having become cognizant of these daily parenteral needs, now manufacture solutions which meet them. Each 1,000 cc. of such soltuion contains:

1. 1,000 cc. of water
2. Approximately 3 gm. of sodium chloride
3. 50 gm. of protein
4. 50 gm. of carbohydrate

To these, vitamins B and C and the necessary antimicrobials can be added. Each liter of such solutions contains half of the daily requirements. Therefore, it has been suggested that, following the patient's morning care, a liter of such solution be administered at the rate of one drop a second. This takes approximately three hours to give. Then the patient may be relieved of further intravenous therapy until the evening, when the second liter is given. In this way, the patient receives his daily requirements of water, 6 to 9 gm. of salt, 100 gm. of protein, 100 gm. of carbohydrates, and the necessary vitamins and medicaments. Let it be stressed again that in no instance should parenteral therapy be utilized if the patient can take fluid or food by mouth.

Nothing by mouth is an order that may be carried to an extreme. In cases of esophageal resection, the order is necessary for three days; in gastric resections, two days. Following this, the patient may have ice chips and sips of water (warm or cool). The next day—tea, dilute orange juice and fat-free broth are added. By the fifth to sixth day, semisolids are given; and at the end of the first week the patient is on a liberal soft diet. In patients not having anastomoses, tea and water are permitted *post nauseam*. Full liquids are given on the third day, and a regular light diet by the fifth to sixth day.

Selye had emphasized the importance of a stress or alarm action to such things as psychic trauma, anesthesia, exposure, surgical manipulation. The medulla of the adrenal gland, when stimulated by stress of trauma, produces epinephrine. This reaches the blood stream and is carried to the anterior lobe of the pituitary gland, which responds with a production of an adrenocorticotropic hormone (ACTH). This hormone is returned to the adrenal gland via the blood stream and stimulates the cortex of the gland, which responds with an outpouring of numerous steroids. Much remains unsolved regarding these steroids as to number and effects; however, the effects of a particular steroid on water and electrolyte balance have been studied extensively This steroid affects the kidney function in such a way that sodium and water are retained, and potassium is excreted. Therefore, it is preferable to withhold some water and sodium for the first twenty-four hours postoperatively and to supply and replenish the potassium loss. It has been the author's practice to supply, in the first twenty-four hours, 1,000 cc. of water in a 5 per cent dextrose solution to which 3 gm. of potassium chloride has been added. No sodium chloride is given during this first postoperative day unless there is a specific indication or depletion.

When To Do What in Children's Surgery

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AS A FIELD of special interest, children's surgery is not new. The first textbook on this broad subject was published in 1563 by Felix Wurtz, a Swiss surgeon, and dealt with the treatment of "the infirmities and defects of newborn children."[1] Interest in pediatric surgery has perhaps languished longer in the Dark Ages than most other surgical specialties, since prior to 1930 few surgeons made concentrated efforts to improve the lot of small patients except in a few isolated areas in the British Commonwealth, Scandinavia and this country. Fortunately, for children everywhere, there now appears to be a re-awakening of concern for the child and his technical surgical problems, his peculiar pathology, his physical, physiologic, and emotional limitations and to the prevention of unnecessary morbidity as well as mortality.

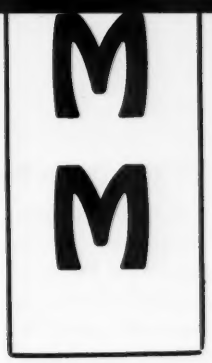
This renewed interest stems from demonstrated need for more fundamental work in this broad field. Recently, C. Marshall Lee, using records and facilities provided by The John Hancock Insurance Company, observed that one-quarter of all surgery (exclusive of that related to maternity and tonsillectomy and adnoidectomy) is currently being done in children under sixteen years of age. In a hospital survey, he also noted that children's hospitals and children's wards in general hospitals are rapidly becoming surgical centers since over one-half, 53.6 per cent, of 116,990 admissions surveyed were to the surgical services.[2] Surgical or semi-surgical maladies (congenital or acquired) are now the leading killers of our young; if one excludes prematurity, the first three causes of death are congenital defects, accidents and malignant disease.[3]

In considering the topic of "When to do What in Children's Surgery" one must include three types of patient problems: the neonatal surgical emergencies, the less urgent problems in older infants and children, and the strictly elective cases. In each instance the physician must balance the expected morbidity and mortality of the disease process if it is to be permitted to run its natural course against the risk of surgical intervention. For most patients three choices are available: today, tomorrow or never.

Neonatal Surgical Emergencies

Fortunately most malformed infants are not museums of congenital anomalies, but suffer from a single remediable defect. During the first few hours of the neonatal period, the major anomalies which are incompatible with continued existence can be corrected with most gratifying results, if the diagnosis has been established before the complications of the developmental malformations have further sapped the vitality of the patient, and if the treatment is initiated by skilled hands.

Obvious lesions such as omphalocele, meningocele, massive teratoma, imperforation of the anus are readily recognized. Similarly, the *early recognition of occult lesions* involving the respiratory and alimentary tract should also be a prime consideration of all professional personnel who attend



When to do what in children's surgery has no cookbook plan or timetable. The proper decision depends upon a clear understanding of the problem, correct and early diagnosis of the patient's condition, knowing the natural history of each disease process and treating children as children and not as little adults.

a laboring mother and her newborn child. The symptoms and signs of respiratory distress (tachypnea, dyspnea, cyanosis) or alimentary tract obstructions (hydramnios in the mother, excessive mucus, bilious vomiting, distention, failure to pass normal amounts of meconium) are, in general, equally clear if they are looked for. An accurate diagnosis can usually be reached quickly without any more complicated studies than normally carried out in any x-ray department (Table I and II).

TABLE I. RESPIRATORY DISTRESS IN NEWBORN INFANTS

If:	Tachypnea, dyspnea, or cyanosis are present
Do:	(1) Clear oropharynx
	(2) Aspirate stomach *via* nose
	(3) Order chest x-ray immediately
Remember: Oxygen is the only symptomatic therapy.	

In general, the younger the infant the less disturbing will be a major surgical procedure. The newborn infant has been living like a lord on the end of a cord; is well hydrated and hypervolemic; is in an excellent nutritional state; has high levels of circulating serum corticoids and inherited antibodies which enable him to adapt to stress and thwart infection. He possesses a high threshhold for pain and thus requires less toxic anesthetic agents; and if handled gently and skillfully, will tolerate major surgery extremely well and recover rapidly—or, if the need arises, he possesses the reserve to weather a prolonged convalescent period.

From three to fourteen days of age, the infant's abilities to withstand surgical stresses seem less effective. He is normally in a catabolic phase—losing weight, his adrenal response is sluggish, and

TABLE II. CONGENITAL ALIMENTARY TRACT OBSTRUCTION

If any *one* exists, suspect obstruction	
	(1) Mother has hydramnios
	(2) The child's abdomen is distended
	(3) Meconium is not evacuated
	(4) Vomitus bile-stained
Do:	Pass catheter into stomach
	X-ray abdomen and chest
	Use barium enema if obstruction is low
	Use lipiodol swallow *only* if obstruction is high and incomplete

it is probably desirable to avoid elective surgical procedures during this period. At the present time, the salvage rate in this small but important group of infants who require surgery during the first month of life is pitifully poor since in a sample area, studied by Rickham,[4] less than one-third of the curable infants survived (Table III).

TABLE III. INCIDENCE OF NEONATAL SURGICAL EMERGENCIES

Liverpool area population	2,113,350
Live births	41,127
Neonatal deaths	809
Congenital defects	133
Surgically curable	54
Cured	15

P. P. Rickham: *Lancet*, 262:332, 1952.

Less Urgent Problems in Older Patients

For the less urgent problems in children a few months or years of age, we must consider several additional factors in choosing the best time for surgical intervention. There remain many physicians who, because of local limitations, may choose to be "conservative" and let a child grow up until he is big enough to be operated upon like an adult. Actually, there is in truth little factual evidence to recommend such an approach particularly if the growing-up period is associated with the crippling morbidity and mortality of attrition.

For example, it has, as recently as 1956, been recommended that such a life-saving surgical procedure as the division of a patent ductus arteriosus be deferred until a child is six to twelve years of age unless he shows signs of heart failure. Yet, if one considers on the one hand the published operative results by age groups, the operative mortality is essentially the same (1.1 per cent under two years; 1.3 per cent, two to five years; 1.5 per cent, five to twelve years) regardless of age of the patient. While on the other hand, it is clear that persistent patency of the ductus arteriosus in an infant or child invites prolonged growth failure in many and for some there is the risk of premature death from such complications as endarteritis and progressive pulmonary vascular changes which may make corrective surgery impossible.[5] It is difficult to avoid concluding that the earlier the operation, the more normal lives will be saved.

The inguinal hernia is a more commonly encountered problem where a similar line of reasoning is applicable. For several years physicians in our area have been referring infants with congenital, indirect inguinal hernias for early, so-called radical surgery, as soon as the hernia is diagnosed. In retrospect, this appears to be a more conservative approach since there is little hope for permanent cure by expectant or truss treatment; since the mortality is nil and the morbidity slight; and the infant is spared running the gamut of such major complications as incarceration and strangulation which may be expected to occur in 10 to 15 per cent of these cases—particularly in the very young infant. Such a forthright approach to this very common developmental anomaly is gratifying to the patient, parents, and physician alike.[6]

By contrast, it seems wisest to be conservative when managing such a self-limited malady as the umbilical hernia which is so commonly observed (15 per cent of white and 25 per cent of colored infants) that it may indeed be considered normal. Furthermore, follow-up studies by Woods in Britain[7] and by Crump and Robinson[8,9] in our Southern states have clearly indicated that 80 per cent of all infantile umbilical hernias close spontaneously by two years of age and that more than 95 per cent will disappear by the time the child enters school.

These are but three examples of the manner by which a detailed knowledge of the *natural history* of the congenital defects should help us in choosing the time of election for surgical intervention.

Elective Surgery

Finally, there are some less tangible problems of less real importance than the disease process itself but which nonetheless deserve consideration in the practice of the art of children's surgery. Problems that we can *all* do something about in every institution in which care is provided for children. These are the nosocomial or hospital-acquired infections which plague the infants—and the emotional disturbances following elective surgery which leave more significant scars than the surgeon's knife on the psyche of the toddler and pre-school child (two to five years of age).

For Infants.—Every hospital facility which admits infants for surgical procedures should provide clean, isolation-type facilities to protect the immunologically immature infant not only from his medically sick neighbors but also from members of the hospital staff who so frequently are the asymptomatic carriers of organisms capable of producing disease in the young child. "Clean" surgical infants should not be mixed with infected or "dirty" infants and both need safe conduct through the heavily traveled areas of our institutions—the admitting office, and the x-ray and operating and recovery suites.

Unless such facilities are provided, it is reasonable to expect that the morbidity of hospital-acquired illness may exceed that of the anesthesia, operation and convalescence, combined.[10]

For Children.—Emotional trauma largely can be prevented by a co-operative amiable organized effort of all people who work with our younger children. During the summers of 1956 and 1957, a carefully conducted study of 104 children two to fifteen years of age was carried out at our hos-

pital to ascertain what could be done about the postoperative emotional disturbances which were obviously occurring in a significant number of these youngsters. Pre-hospitalization, in-hospital and post-hospital visits with the patient and the parents were conducted. It was found that 69 per cent of the children had a *good* adjustment to the hospital experience.

The remaining 31 per cent of the children suffered from significant emotional upsets following elective surgical procedures. Fortunately, only 6 per cent had serious prolonged regressive manifestations—fears, bed-wetting, anxiety and withdrawn behavior. Similar observations (26 per cent poor adjustment) have been reported by Jessner and Kaplan following tonsillectomy and adnoidectomy. Prugh reports 36 per cent similarly afflicted from hospitalization, alone. In all studies the most serious disturbances were most noted in the two and three-year-old children.[11,12]

In our study there seemed to be certain things that were particularly disturbing: induction of anesthesia (50 per cent), shots (45 per cent), separation from parents (33 per cent). Examinations and white coats bothered few. Fortunately, there were some things the youngsters liked about our hospital too: toy ladies (50 per cent), other children (30 per cent), nurses (20 per cent), snacks (15 per cent), and television (10 per cent).

A review of this material would lead us to the conclusion that the best way to avoid emotional disturbances in the child and probably the family is to *do as much elective surgery as possible in infancy—the earlier the better;* and to avoid elective hospitalization, particularly in those youngsters two to four years of age; to spend a brief period of time preparing the child and his family for the hospital experience; to use long-acting oral medications wherever possible; to have adequate play areas where pre-school children can get well together; allow frequent visiting; and, above all, to insist on adequate premedication before the induction of anesthesia (Table IV).

Emotional disturbances are not all limited to hospitalization. Correction of cosmetically important developmental aberrations, including being a well-balanced boy with two testicles instead of one; possessing a male urethra which shoots straight; or pinned-back ears if nature has been too generous; or removal of an ugly birthmark—all constitute psychologically sound surgery if done before the child enters the school environment.

TABLE IV. PREVENTION OF EMOTIONAL TRAUMA IN CHILDREN

Honest orientation of parent and child
Long-acting or oral medications
Frequent visits or rooming-in
Toy carts—play areas—television
Adequate premedication—sleep

Perform elective surgery in infants under two years of age. Avoid elective surgery in three to five-year age group.

In summary, there is no cookbook plan for what to do when. In a final analysis, like most things in medicine—the proper decision is dependent upon a clear understanding of the problem; the correct and early diagnosis of the patient; knowledge of the natural history of each disease process; recognition that children are fine surgical risks if they are treated logically *as children and not just little men and women.*

References

1. Ruhrah, John: Pediatrics of the Past. New York: Paul B. Hoeber, 1925.
2. Lee, C. Marshall, Jr.: The Significance of Pediatric Surgery. Report of the 27th Ross Conference, 1957. Published in 1958 by Ross Laboratories, Columbus 16, Ohio.
3. Bureau of Vital Statistics: Ohio, 1949. Published in 1958 by Ross Laboratories, Columbus 16, Ohio.
4. Rickham, Peter P.: Neonatal surgery, early treatment of congenital malformations. Alder Hey Children's Hospital, Liverpool, England. Lancet, 262: 332, 1952.
5. Clatworthy, H. William, Jr., and McDonald, Victor G.: Optimum age for surgical closure of patent ductus arteriosus. J.A.M.A., 167:444 (May) 1958.
6. Clatworthy, H. William Jr., and Thompson, Allan G.: Incarcerated and strangulated inguinal hernia in infants: A preventable risk. J.A.M.A., 154:123-126 (Jan.) 1954.
7. Woods, Grace E.: Some observations on umbilical hernia in infants. Arch. Dis. Childhood, 28:450-462 (Dec.) 1953.
8. Crump, E. Perry: Umbilical hernia, part I. Occurrence of the infantile type in Negro infants and children. J. of Pediat., 40:214-223 (Feb.) 1952.
9. Crump, E., Perry, and Robinson, Judkin M.: Umbilical hernia, part II. Occurrence in Negro adolescents and young adults. J. Pediat., 40:777-780 (June) 1952.
10. Izant, Robert J., Jr.: Nosocomial Infections in a Children's Hospital. Report of the 27th Ross Conference, 1957. Published in 1958 by Ross Laboratories, Columbus 16, Ohio.
11. Jessner, J., and Kaplan, J.: *In* Senn, M. J. E. (ed.): Problems of Infancy and Childhood. Proceedings of conference sponsored by Josiah Macy, Jr., Foundation, 1949.
12. Prugh, D. G.: Emotional Reactions to Surgery. Report of the 27th Ross Conference, 1957. Published in 1958 by Ross Laboratories, Columbus 16, Ohio.

Chest Injuries from Automobile Accidents

Are you likely suddenly to face the responsibility of the emergency care of this magnitude?

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THE AUTOMOBILE, our friend, servant or enemy depending upon your point of view, is the most frequent cause of the thoracic injuries which we encounter clinically. The relatively frail human form, whether it be driver, passenger or pedestrian, in competition with this speeding mass of steel and plastic, invariably comes out second best in the resulting crash. If the victim survives the original ordeal and reaches the hospital, he confronts the attending physician with serious surgical, physiologic, and mechanical problems.

Crushing or compression injuries constitute the vast majority of the injuries encountered, although occasionally a closed penetrating wound and, very rarely, an open penetrating type of wound is encountered. Any of the three types may be fatal and each presents its own particular hazards and complications.

The crushing or compression type of injury may occur in a variety of ways: (1) from direct crushing or compression of an individual who is pinned beneath the car or other object, or a child crushed under a larger individual, (2) deceleration type of compression injury from a head-on collision or a speeding car striking a relatively immovable object and forcefully throwing the driver against the steering post or a passenger against the instrument panel or the back of the front seat, or hurling an individual from a car to the ground or against some other object, (3) a direct blow to the chest or a pedestrian struck by a car fender and knocked to the ground or against some other object. All degrees of variation and extent may be encountered from a mere superficial contusion to fracture of one or more ribs to multiple fracture of all ribs, with rupture of anything within the thorax.

The chest is a peculiar structure and it is perfectly possible, at least in young individuals, to compress the chest in an anterior-posterior direction to such an extent that the sternum is practically in contact with the vertebral bodies without fracture of rib or cartilage. Then, with the release of pressure the chest wall and sternum may spring back to the original position leaving no external evidence of the compression except perhaps some contusion or abrasion of the skin. For this reason, the physician may fail to appreciate the seriousness of injury to the thoracic organs, or the possibility of such injury being present when a patient is first seen. Should rib fractures occur as a result of such a compression, they are most likely to occur in the midaxillary region with the spicules of broken rib directed outwards with little tendency to penetrate lung, pleura or the intercostal vessels. An oblique application of force may give fractures posteriorly on one side and anteriorly on the other side.

A compression of similar nature in an older individual may result in bilateral anterior rib fractures with or without costochondral or chondrosternal separations or fracture of cartilage. Such fractures, particularly anteriorly, may give rise to a great deal of abnormal chest wall motion, the so-called flail chest. Transverse fracture of the sternum may occur with or without much displacement, the tendency being for the upper fragment to over-ride the lower. Respiratory embarrassment and interference with cough and expectoration with retained or aspirated secretions or other material may follow with subsequent respiratory ambarrassment, atelectasis, pneumonitis or abscess formation.

Even without apparent gross damage to the thoracic cage, serious if not fatal damage to any of the important structures within the chest may result from such compression. Rupture of an auricle, ventricle, aorta, vena cava, pulmonary artery or vein, or azygos vein may occur and be fatal within a short period of time. Damage to coronary vessels or to the myocardium may result, and while not immediately fatal, it may be subse-

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quently, or it may give rise to serious handicaps. Rupture of the trachea or bronchus may occur and if not promptly recognized and relieved may give rise to serious or even fatal tension pnuemothorax. Rupture of the lung parenchyma, unilaterally or bilaterally, may produce extensive pneumothorax unilaterally or bilaterally which may go on to collapse with a fatal outcome.

Traumatic rupture of the bronchus or trachea usually occurs near the bifurcation or in one of the major bronchi. Occasionally the trachea is ruptured in the cervical region, a serious condition which must be recognized and treated promptly. If suspected, it can be proven easily by bronchoscopic visualization and immediate surgical repair by direct anastomosis carried out. A few patients with rupture of the bronchus may recover following decompression of tension pneumothorax, the ruptured bronchus healing with stricture formation and loss of function of the involved lobes.

Rupture of the diaphragm, more commonly on the left but occasionally on the right, with protrusion of abdominal viscera into the thoracic space may follow any crushing injury of chest or abdomen and seriously embarrass respiration and ventilation. Nasal suction to reduce distention of a herniated stomach or intestinal loop as well as to reduce the chance of incarceration and obstruction may be used to advantage to relieve respiratory distress. Following severe trauma to the chest or abdomen no patient should be discharged from observation until the integrity of the diaphragm has been demonstrated. Traumatic diaphragmatic hernias because of subsequent adhesions present greater danger of intestinal or colonic obstruction than other types of diaphragmatic protrusions.

Rupture of air vesicles within the lung with air leakage out along the vascular sheath of the great vessels into the mediastinum can give rise to serious compression of thin-walled structures with serious consequences if the mediastinum is not decompressed. If the dissecting air escapes to the fascial planes above, an extensive and distressing subcutaneous emphysema may follow, however, this is usually not fatal.

Rupture of the esophagus occurs rarely but may be followed by fatal mediastinal infection or more rarely by tracheo-esophageal fistula. Tearing of internal mammary or intercostal vessels or laceration of the lung may result in serious internal bleeding with hemothorax, even of an exsanguinating type. Weakening but not complete rupture of the aortic wall or the wall of other great vessels may result in an aneurysm later.

Intrapulmonary hematoma or mediastinal hematoma occasionally is encountered following traumatic injuries to the chest but usually, except for an occasional mediastinal hematoma with compression of the thin-walled veins, does not call for surgical intervention.

Laceration of the lung from tearing of the lung by rib splinters may give rise to extensive hemothorax, pneumothorax or subcutaneous emphysema, or all three, and may require early thoracotomy.

Because of the potential possibilities of chest injuries and our inability, when the patient is first examined, to accurately assess the seriousness of the original injury or the amount of damage which has been done, these patients should be hospitalized, thoroughly studied, and observed until the exact nature and extent of the injury can be determined. Blood studies including hemoglobin, white count, hematocrit and probably blood volume, should be recorded as a base line for comparison with future studies in order to determine the extent of blood loss. The patient should be cross-matched for transfusion without delay since emergency transfusions may become necessary. A routine electrocardiogram should be made because of the possibility of damage to the myocardium or coronary circulation and again as a comparison for subsequent cardiac studies. Good x-ray pictures of the chest should be made with detailed studies of ribs as indicated when the patient's condition will permit. The number, position and extent of rib fractures may not be determined on preliminary examination as the chest films on chest injury cases are often not particularly satisfactory because of poor technical quality or because the fracture sites are obscured by hemothorax or subcutaneous emphysema, imperfect position, overlapping structures, or lack of displacement at fracture sites. Physical examination with local crepitation or point tenderness over the fracture site may give a more accurate index of rib fracture than the x-ray films. Some rib fractures only become evident by callus formation at a subsequent date. The over-riding rib fragments following a direct blow heal with deformity and bony bridging between the affected ribs, giving fixation of the chest wall and reduc-

tion in respiratory chest wall motion. These patients are usually not in condition for surgical attempts to correct the deformity. The results of such attempts outside of traction are not too encouraging.

Closed penetrating injuries of the chest rarely occur in automobile accidents. They may occur from penetration of the chest by a splinter of glass or wood from a tree or guard rail, a projecting object from another car or truck, or some object on the roadside when the patient is thrown from the car, or in the case of a pedestrian, from a pointed radiator emblem or a projecting door handle on an older model car. The seriousness of such an injury depends on the size, nature and depth of penetration and the structure within the chest injured by it. It should be the rule if there is deep penetration that the penetrating object not be removed except at thoracotomy in the operating room with facilities immediately available for the control of serious bleeding which may follow the removal. More rarely we encounter a penetrating wound in which the chest is actually torn open widely enough so that a sucking chest wall results. These occur occasionally from the spoke of a broken steering wheel or some larger object penetrating the chest. These are extremely serious. The suction must be stopped at once by any means at hand, with surgical correction of the damage and the defect carried out promptly thereafter.

Primary consideration in the treatment of traumatic injuries of the chest involve three general points: (a) control of hemorrhage, (b) treatment of shock, (c) restoration of cardiac and respiratory physiology. While simply stated, these three points are not always easily accomplished.

The general regime of treatment of these patients includes the following:

1. *Avoidance of Injury in Moving.*—These patients should be handled as gently as a cracked egg. Any rough handling in lifting or turning in the presence of fractured ribs may aggravate the injury or initiate bleeding, tear the lung or pleura, and superimpose bleeding, pneumothorax or subcutaneous emphysema upon the already-traumatized patient. The same may also be said about over-enthusiastic efforts to strap or immobilize the chest wall, thereby overlapping rib fragments and aggravating the damage.

2. *Treatment of Shock.*—The amount of shock present in these patients will vary widely from little or none to a very marked shock state. It must be treated by appropriate measures. One must be doubly careful not to assume that a shock-like state is due entirely to trauma, but rather be sure it is not due to internal hemorrhage or to a tension pneumothorax, both of which require different treatment.

3. *Oxygen.*—Many patients need oxygen for relief of dyspnea and cyanosis and should receive it freely, if not routinely. It must be remembered, however, that while the use of oxygen may reduce respiratory effort, it will not overcome the deleterious effects of an unstable chest wall, the mechanical handicap of a tension pneumothorax, or the air hunger resulting from depletion of the circulating red cell mass by internal hemorrhage.

4. *Stabilization of the Chest.*—If, because of multiple rib or cartilage fractures or separations, the chest wall becomes unstable, paroxysmal breathing will occur with serious disturbance of both respiratory and circulatory physiology. A sucking chest wound must be closed immediately by packing, strapping or suture, or serious consequences will follow. An unstable chest wall permits inspiratory retraction and expiratory bulging which not only interferes with aeration of the lung and with the expulsion of secretions but also results in circulatory embarrassment by upsetting the normal intrapleural pressure relationships which are essential in cardiac input and output. The chest wall motion must be controlled or minimized by posture, application of external weights, strapping, adhesive binders or by skeletal traction on the sternum or ribs. If these measures are not immediately successful, tracheotomy by cutting down the respiratory dead space and reducing inspiratory effort will greatly reduce the false motion and can be life-saving. Assisted respiration by mechanical apparatus may also help.

5. *Hospitalization.*—These patients should be hospitalized immediately for study and observation, even though at the moment the injury appears to be not too serious. Careful physical examination should be made to determine if possible the extent of injury to the chest as well as to other portions of the body. The association of multiple fractures and trauma to the abdomen,

spine, neck, face and skull may seriously interfere with the treatment of the thoracic condition. Vital signs must be watched and blood pressure readings taken and recorded frequently and blood studies made as previously mentioned. The urine should be examined. An electrocardiogram should be made for immediate information as well as for future reference. X-ray studies should be made as extensively as the patient's condition will permit. If the patient is in shock, of course, the head-down position is mandatory to avoid cerebral anoxia. If not in shock, the patient will breathe better, feel better and do better in a semi-sitting position propped up on a back rest.

6. *Control of Pain.*—Some of these patients are in great pain because of multiple fractures. This pain is aggravated by the effort of breathing and coughing so it is essential that some relief be given. Control of pain may relieve a shock-like state. Morphine and its derivatives will relieve pain and apprehension, but are a two-edged sword in that they take away the desire to cough and thus favor retention of secretions locally formed or aspirated into the lung. They should therefore be used in reduced dosage that will not "knock the patient out." The patient must be encouraged to cough and raise sputum periodically in order to keep the air passages free of secretion. Intercostal nerve block proximal to the fracture sites will definitely relieve pain and enable the patient to cough more effectively. Care must be taken, however, to avoid injury to the lung by the anesthetic needle or an accidental pneumothorax may be superimposed on the existing injuries.

7. *Watch for Internal Bleeding.*—Internal bleeding occurs frequently in all types of chest injuries. Coagulation of blood does not occur readily in the pleural cavity so bleeding tends to continue insidiously. Any rapid accumulation of fluid in the chest following an injury is blood and not serum. If the physician will only realize that a patient can bleed to death into one pleural cavity and that 3,000 cc. of blood and fluid can accumulate in one pleural cavity without much displacement of the heart or mediastinum, he will become more alert to the dangers of this complication. It is very difficult to estimate with any degree of accuracy the amount of blood which has accumulated in the pleural cavity. Base-line studies of blood (previously mentioned) compared with studies at a subsequent time may give some idea of the loss. If the chest fills up quite rapidly, it usually indicates arterial bleeding or injury to a larger vessel which presents a greater indication for immediate surgical control.

Blood within the pleural cavity, if it is not mechanically embarrassing or sufficient to demand immediate surgical intervention, need not be immediately removed since the mass of the blood itself not infrequently tends to tamponade and control the bleeding. Blood in the pleural cavity tends to remain liquid for some time, particularly in the absence of extensive damage to chest wall muscle and lung which would furnish hemostatic substance. Early aspiration may tend to restart the bleeding. The blood should be removed, however, after two or three days in order to minimize clotting and subsequent loss of lung function. If clotting occurs and the residual hematoma exceeds 20 or 25 per cent of the volume of the one lung, decortication with removal of the hematoma should be undertaken. This may be done at any time up to ten or twelve weeks without too much difficulty. With less than this amount, the impairment from the retained blood after absorption will probably not reduce function any more than the limitation following thoracotomy.

8. *Transfusion as Necessary.* — Transfusion must be used to replace blood loss but must not be overdone as it is possible to push a patient into pulmonary edema. It is impossible by ordinary transfusion methods to keep ahead of the steady bleeding from an internal mammary or intercostal artery, to say nothing of that from a larger vessel. Rapid or continued internal bleeding calls for thoracotomy and surgical control of the bleeding if other conditions will permit such surgical intervention.

9. *Watch for Pneumothorax.*—Pneumothorax in varying degrees occurs frequently in all types of chest injury, and not a few patients die from an unrecognized pneumothorax. It may be small in amount and not particularly embarrassing to the patient, or a tension pneumothorax may develop unilaterally or bilaterally which will seriously threaten or jeopardize the patient's life. A tension pneumothorax is any pneumothorax in which the pressure builds up to the point where

it is embarrassing to the patient. If the physician will only think about the possibility of the condition, he can easily diagnose it on physical examination: the side will be splinted; the percussion note will be normal to hyper-resonant as compared to dullness or flatness associated with fluid; the breath sounds will be distant to absent—especially anteriorly when the patient is supine, whereas with fluid, the lung frequently floats up in a recumbent position with breath sounds present in front. The heart and mediastinum will be displaced to the opposite side if there is tension of any appreciable degree with disappearance of the substernal dullness, muffling of the heart tones at the base, and palpable displacement of the trachea in the suprasternal notch.

The relief of a tension pneumothorax requires no special apparatus. Frequently the insertion of a needle into a tension pocket will be followed by the plunger blowing out of the syringe by a rush of the escaping air which will continue until the excess pressure is relieved. The rule is that a tension pneumothorax tends to recur and consequently one must make provision for repeated decompression by inserting a small catheter in the second anterior interspace in the midclavicular line and connecting it to an under-water breakover so that any accumulating pressure will be dissipated through the water seal. The insertion of a catheter at the base posteriorly is proper for the removal of fluid but soon plugs with fibrin and does not remove the airpocket which forms anteriorly. If both fluid and air must be removed, two catheters should be used. A constant, negative pressure suction pump with very low negative pressure of 1 or 2 cm. of water may be substituted for the under-water breakover. Traumatic pneumothorax may occur bilaterally and must be promptly recognized and relieved or the patient may succumb rapidly. Pneumothorax may not be present when the patient is first seen but may develop insidiously hours afterwards or may develop dramatically after an episode of coughing or straining.

10. *Removal of Secretions.*—Following thoracic injuries, patients are embarrassed frequently by the accumulations of secretions in the tracheobronchial tree—aspirated material from postnasal mucous drainage, blood or secretions from injuries to the nose, face or mouth, or from aspirated gastric contents, as well as in the patient with bronchitis, bronchiectasis, or tuberculosis, and in the chronic smoker. Because of pain, instability of the chest wall with loss of cough effort, injudicious use of sedatives, or the drying effect of oxygen inhalation or mouth breathing, the inability to expel these secretions may become a serious problem. Respiratory exchange is impaired if secretions are not removed from the tracheo-bronchial tree, and atelectasis follows with increasing dyspnea, and subsequently pneumonitis, pneumonia or abscess may occur. It is the physician's duty to see that secretions are removed from the chest. If, by stabilization of the chest and control of pain, the patient is able to cough and raise, then nothing further is necessary.

Thinning of secretions by the use of expectorents, by adequate hydration of the patient or by the use of water vapor will facilitate bringing up these retained secretions. Support of the chest wall during a cough effort may aid expulsion of secretions. If they cannot be removed in this way, they should be aspirated through a catheter passed through the nose or directly through a laryngoscope after spraying the pharynx and larynx with a local anesthetic solution. The unconscious patient may have his tracheobronchial tree aspirated by a nasal catheter without anesthesia as often as necessary. An endotracheal tube may be used for short periods of time. Bronchoscopy and bronchial suction through this instrument are effective means of removing secretions but frequent repetition is not advisable. Tracheotomy which permits repeated suction of the tracheo-bronchial tree as often as is necessary, can well be a life-saving measure for these patients.

10. *Chemotherapy.*—Patients with chest injuries must be treated adequately with antibiotics —particularly if there has been a recent respiratory infection, if bronchitis or bronchiectasis was present, or if the patient aspirated blood, stomach contents or other material at the time of or subsequent to the accident—in order to minimize the chances of pneumonitis or pulmonary abscess.

Conclusion

Trauma to the chest from automobile accidents is a common and usually very serious type of injury. Many things may be done to afford relief to these patients. Many of them present serious situations which will tax the ingenuity of everyone concerned in their treatment.

Urinary Diversion: Uretero-sigmoidostomy with Continent Pre-anal Colostomy

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(Continued from May issue)

Surgical Technique

1. *Preoperative Preparation.*—After a definite diagnosis of carcinoma of the bladder is made and confirmed by transurethral biopsy of the lesion and bi-manual palpation under anesthesia of the area of the lesion has been done at time of cystoscopy and its fixation or non-fixation determined, a proctoscopic examination and air contrast study of the colon is done. If an excretory urographic series has not been performed prior to the cystoscopy and biopsy procedure, this is also in order. A survey of the chemical pattern of the serum consisting of blood urea nitrogen, creatinine, urea clearance, chlorides, sodium, potassium, carbon dioxide combining power and uric acid is obtained. Chest film in search of metastasis is made. Three days prior to surgery, the patient is placed on a low residue diet and the day prior to surgery the regimen of bowel sterilization as recommended by Poth[9] is started as follows:

At 12:00 noon the day before surgery (regimen is modified by Johnson[3]), 60 cc. of castor oil, 1.0 gm. of Neomycin with 250,000 units of Nystatin and 1.5 gm. of phthalysulfathiozole.

At 1:00 P.M., 2:00 P.M., and 3:00 P.M., 1.0 gm. of Neomycin with 250,000 units of Nystatin and 1.5 gm. of phthalsulfathiozole. These medications are given in the same amounts at four-hour intervals thereafter until the time of surgery, excluding the four-hour period prior to surgery, in order that the upper gastrointestinal tract may be empty and avoid any danger of vomiting during anesthesia. One hour before surgery, a rectal catheter is placed and one quart of 1 per cent Neomycin is instilled and the indwelling rectal catheter is clamped until the time of surgery.

2. *Anesthesia.*—Pentothal sodium with curare is administered intraveneously with supplemental nitrous oxide and oxygen via an intratracheal tube.

3. *Technique.*—The technique of the procedure is divided into the urologic procedures and

the proctologic procedures, the latter consisting of three parts: the abdominal field, perineal field in the first stage, and the revision operation seven to eight days after the first-stage operation.

4. *Procedure:* (1) *Urologic Surgery—First Step.*—Routine urethrocystoscopic examination is first made to determine the status of the urinary bladder as compared with the previous studies and areas of the biopsy are inspected. The bladder is thoroughly irrigated with a 1:5000 solution of aqueous zepherin solution and catheters passed if possible to both renal pelves and left indwelling. The left catheter with a straight end to indicate the left side (senestra, left, straight), and the right cut obliquely or diagonally (dextra, right, diagnonal). These catheters are splinted by an indwelling No. 16 French 5 cc. Foley bag catheter and again the bladder thoroughly irrigated with 1:5000 aqueous zepherin solution. The urethral catheter is connected to an irrigating unit with the flask of the unit filled with 1:5000 aqueous zepherin solution so the bladder may be filled with fluid as required during the procedure.

The patient is placed supine in low lithotomy position with well-padded knee crutches elevated 10 to 12 inches from the level of the table. All catheters and the patient are prepared with an antiseptic solution. Trendelenburg position with sand bag under the hips increases the exposure of the pelvic fossa. A midline incision is made from the symphysis to the mid-hypogastric area circumscribing and removing the navel. The rectus muscles are retracted lateralward after incising the linea alba. The pre-vesical and pre-peritoneal areas are explored and the peritoneum is not opened unless necessary prior to cystectomy. The loose tissue of the bladder is separated by blunt dissection and the peritoneum is stripped from the bladder and the urachus identified and doubly clamped and divided. The upper stump of the urachus is ligated and a traction suture is placed in the lower stump. The peritoneum is next stripped from the posterior surfaces of the bladder and if the peritoneum is found to be involved, the peritoneum is opened and the area of tumor involvement of the peritoneum is excised widely. The bladder is freed from its peritoneal attachment and pulled upward and the lateral surfaces of the urinary bladder are freed by sharp and blunt dissection. The vesical arteries are identified and particular care is given to the lateral vesical pedicles containing the superior vesical artery because of the proximity to the ureter. The ureters can be easily palpated with the indwelling catheters in place. The remainder of the vascular pedicles supplying the bladder are identified and doubly clamped, divided and ligated. The vasa are exposed as they cross the ureters, doubly clamped, divided and ligated. The ureters have been identified and are liberated as they enter the area of the bladder. They are divided including the indwelling catheters within the lumen and at this point the indwelling catheters are removed and polyvinal size No. 6 French catheters are inserted to the pelvis and the ends are treated as above, leaving the left straight and cutting the right at a diagonal. The indwelling catheters within the ureters are secured by single suture No. 000 chromic catgut placed at the distal end of the ureter. The catheters are placed to drip outside the operative field. With the bladder empty the base of the bladder is easily brought up into the wound and the attached seminal vesicles are stripped from the rectum and the rectum is completely separated from the posterior surface of the urinary bladder and the prostate. The pubo-prostatic ligaments are identified anteriorly and these are divided between forceps and ligated. The vascular plexus is also clamped and divided and ligated. The prostate is separated from its attachments by blunt dissection leaving the bladder and prostate attached only by the urethra which is divided by sharp dissection and left open as a secondary drainage point. The catheter in the urethra is an aid in this dissection and after the urethra and catheter has been cut across, the indwelling catheter is removed. Bleeding in this area can be controlled by packing and then suturing these areas with No. 000 plain catgut. All fatty tissue and lymph nodes in the area are dissected free and stripped down to the great vessels and to the anterior surface of the rectum.

After hemostasis has been secured in the entire area, the peritoneum is next opened and the abdominal contents carefully palpated, particularly the liver in search for metastasis.

2. *Proctologic Surgery—First Step.*—The proctologist's contribution to this operation commences with the division of the recto-sigmoid at its junc-

tion between two large Kocher clamps. The perirectal and pericolic fat is removed from the serosa of both segments of bowel particularly the rectal stump, in preparation for closure.

3. *Urologic Surgery—Second Step.*—An open uretero-proctostomy is performed under direct visualization. After thoroughly cleansing and irrigating the new urinary bladder with 1 per cent Neomycin solution, points at which both ureters easily reach the rectum are identified and a small incision, the size of the ureter, is made in a longitudinal plane through the rectal wall on its posterior-lateral aspect choosing a location so the ureter lies in the sacral curve. Each ureter is transplanted by grasping the previously placed fixation suture and the ureteral catheter and drawing both into the rectal lumen. The catheter is next passed downward toward the anus through a previously placed rectal tube. The mucosa-to-mucosa approximation of the ureter to rectum is carried out over the catheter with No. 000 atraumatic chromic catgut. The ease with which this can be accomplished is amazing because of the widely exposed operative area, but nevertheless it should be done cautiously and precisely. Three or four sutures are placed in the adventitia of each ureter and the adjacent rectum, being careful not to angulate the ureter.

4. *Proctologic Surgery—Second Step.* — The proximal rectum, measuring approximately 13 to 15 cm. from the anal verge is closed by approximating the mucosa with an inverting type Connell suture, then Halstead No. 3 silk sutures are used to approximate the sero-muscular layer, and avoiding the mucosal layer.

The sigmoid colon is mobilized next, in preparation for a perineal "pull-through" procedure by incising the lateral peritoneal reflexion up to the splenic flexure. Next, the inferior mesenteric artery and vein are doubly clamped, transected and ligated, just distal to the origin of the left colic artery and vein. This in most cases gives sufficient mobility, granting a semi-redundant sigmoid colon is present, to exteriorize the distal sigmoid colon well beyond the perineum. Particular care is taken to provide adequate vascularity by the marginal artery of Drummond in this procedure. No undue traction can be placed upon the bowel as it is prepared for the new perineal anus.

Perineal Phase.—At this point, the patient who is already in stirrups, is elevated to full lithotomy position and the perineal operator makes a semilunar incision along the anterior and anterior lateral margins of the external anal sphincter. Care is taken to preserve a skin island approximately 3 to 4 cm. in width between the former anus and the new anterior anal canal. The tissues of the perineum are carefully spread with a hemostat until the prostatic bed is encountered. Further dissection should be accomplished by blunt-finger method. The entire external anal sphincter is exposed around its external periphery to its lateral margins (Fig. 1).

The anal sphincter is carefully but forcibly dilated to admit at least 3 to 4 fingers. At this point we consider the division of the external anal sphincter to be an important contribution to the original operation as proposed by Johnson. The external anal sphincter is divided so the proximal one-half of the sphincter continues to encircle the former anus which is now the outlet of the new urinary bladder. The distal or caudal one-half of the sphincter, that is, the anterior and lateral phases are carefully and slowly dilated so that it will surround the "pull-through" colon which is soon to be introduced into its lumen. Next a large Carmalt hemostat is introduced through the prostatic bed and the abdominal operator introduces the distal sigmoid colon to this clamp. The bowel is carefully threaded through the perineum and through the divided caudal one-half of the external anal sphincter.

This is perhaps the most important part of the perineal dissection. It must be performed slowly and with considerable caution. If the colon is surrounded by considerable pericolic fat sufficient to produce marked tension upon the anal sphincter, longitudinal division of the sphincter in its anterior portion must be considered. The cut ends of sphincter can be marked with long silk sutures for future recovery. In case the tension is great, immediate postoperative strangulation will result. Approximately 6 to 8 cm. of "pull-through" bowel is exteriorized to compensate and allow for subsequent retraction. A large mushroom catheter is inserted in the "pulled-through" bowel and secured by a Daniel clamp. A vaseline gauze dressing is applied around the "pulled-through" bowel. The abdominal wound is then closed by the abdominal operator, establishing drainage from the space of Retzius with no attempt being made to

peritonealize the pelvic floor. A sterile rubber glove is placed over the Daniel clamp including the rectal tube in the new rectum. The ureteral catheters are secured to the perineal skin just of the oral route. An excretory urogram is done on the fifth or sixth postoperative day. The ureteral catheters are removed on the seventh day and the bladder catheter is left in place.

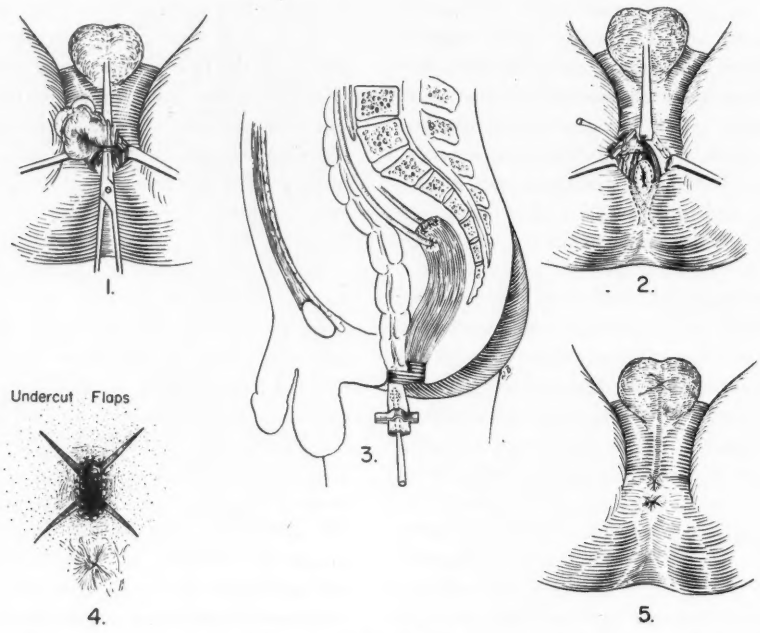


Fig. 1. Reconstruction of anus with rectal bladder (Garske-Sherman). *Perineal Phase I:* (1) Sigmoid colon carefully teased through caudal half of external anal sphincter. (2) Large mushroom catheter secured in bowel with a Daniel clamp, placed 7 to 8 cm. from sphincter. (3) Sagittal view to demonstrate treatment of external anal sphincter muscle. *Perineal Phase II:* (4) Redundant bowel amputated, sutured to undercut perineal skin flaps, to obviate mucosal prolapse. (5) Final postoperative result.

distal to their exit from the rectal catheter in the new bladder. Both ureteral catheters and the catheter in the new bladder are connected with a sterile plastic tubing to a urinary drainage bottle.

4. *Postoperative Care (Early).*—Patient should be weighed daily. Fluid and electrolyte balance is maintained by daily intravenous fluids based on daily chemical serum pattern determinations. Nasal suction is utilized until bowel activity returns to normal function and then removed. Supplementary parenteral vitamins and antibiotics are a must. Careful fluid intake, and output of ureteral and new bladder catheters must be carefully recorded. Ambulation usually the second postoperative day. As soon as possible after the suction has been removed a soft low salt diet is ordered and parenteral medications are discontinued in favor

5. *Proctologic Surgery—Third Step (Excision of the Redundant Bowel: Revision Operation).*—Approximately seven to eight days postoperatively, depending upon the condition of the patient, he is returned to the operating room. Under spinal anesthesia, in a "jack-knife" position, the redundant bowel is excised over a Payr clamp. Particular care must be made to free the bowel from the surrounding perineal tissues, and the Payr clamp must be placed at a level corresponding to the cephalad portion of the divided anal sphincter. In case the sphincter muscle has been divided to avoid strangulation of the "pulled-through" bowel, it can be reconstructed at this stage of the procedure. Care at this point will insure against subsequent mucosal prolapse and a bothersome wet anus due to mucosa extending beyond the anterior portion of the anal sphincter. Next, three

or four flaps of perineal skin are developed by undercutting; these are sutured with interrupted 00 chromic catgut sutures to the mucosa and muscularis of the recently excised bowel. This is done much as the standard anoplasty for mucosal prolapse of the rectum. Upon its completion, a vaseline gauze dressing is applied (Fig. 1).

Postoperatively, the patient is administered hot packs to the anal area for several days to be followed by Sitz baths. As soon as the anal edema has subsided, the patient is instructed in the use of sphincter exercises. The new bladder catheter is removed on the ninth postoperative day.

6. *Future Follow-up.*—The patient is discharged with:

1. A low salt diet.
2. Soda bicarbonate.
3. Antibiotic or chemotherapeutic agent specific for organism found on sensitivity and culture of the urine from the new bladder.
4. Residual urine is checked at each office visit and the residual is examined microscopically and cultured. The culture is plated and sensitivity studies run to determine medication of choice.
5. Instructions for sphincteric exercises are given.
6. Rectal irrigations.
7. Cathartic.

Serum chemical patterns are done monthly. Excretory urograms are done at three, six, nine, and twelve months for the first postoperative year and then every six months thereafter. A cystoscopic examination with chromorectoscopy (indigo carmine intravenously) is done in six months, and retrograde rectograms for reflux at three months postoperative.

Amphetamine sulfate and decrease in oral fluid intake after late afternoon will control nocturnal enuresis.

Report of Cases

Case 1 (B.R.L.J.—Age: thirty-six).—Admitted February 11, 1958, with a history of sudden onset, one week prior to admission, of gross total painless hematuria with the passage of one large clot. The patient had had an episode of "flu" and he attributed the possibility of the urinary bleeding to reaction from an acute infectious process. He had noted a similar episode two months prior to admission which lasted intermittently with the voidings for two days. He noted no renal pain or discomfort, nocturia, increased frequency, or dysuria. The patient had a meatal stenosis in 1938 treated by meatotomy and dilatation without symptoms since the surgery.

Physical examination revealed an alert, well developed, well nourished, co-operative white male with a normal temperature, pulse, respiration and blood pressure. No abnormalities of the head, neck, heart, lungs and chest were noted. Examination of the abdomen was normal. Normal male genitalia were noted with the exception of a small scar from the previous meatotomy. The prostate was found to be symmetrical and of normal size, shape and consistency and without tenderness or induration, and no supra-public abnormality was found. The remainder of the rectal examination was normal.

Laboratory Findings.—The hemoglobin was 15.8 gm., 9,000 leukocytes with a normal differential. The serology was negative. The sedimentation rate was 7 mm. in one hour. The urine was grossly bloody with a pH of 5.5, specific gravity of 1.032, two plus albumin, negative sugar and acetone and packed fields of red blood cells on microscopic study. The urine culture was negative.

Admission chest film showed no abnormalities. An excretory urographic series on February 12, 1958, showed no abnormalities on the preliminary film prior to injection of contrast material. After injection of 20 cc. of 30 per cent Urokon, the excretion rate of the contrast material was normal bilateral and there were no abnormalities noted in either kidneys or ureters. Three irregular overlapping filling defects, 2 to 3 cm. in diameter were noted in the right hemisphere of the urinary bladder and the outline of a Foley bag catheter could be seen deflected to the left of the midline (Fig. 2).

Cystoscopic examination on February 13, 1958, using pentothal, curare, nitrous oxide and oxygen anesthesia revealed an external urethral meatus with a small scar from the previous meatotomy. The urethra was otherwise normal. A low grade, chronic, non-specific prostatis was noted. The bladder urine was grossly bloody and several small clots were noted on the floor of the bladder. There was no evidence of intra-vesical calculus, foreign body, or diverticulum. Situated over and obscuring the right ureteral orifice was a soft friable, papillary tumor measuring 1.5 cm. in diameter implanted on a broad base beyond the orifice and extending up the lateral wall of the bladder to the region of the vesical neck. The tumor was a typical papillary carcinoma with superficial necrosis, sloughing, and evidence of recent hemorrhage, and elevated 1.5 cm. from the mucosa. Two discreet papillary tumors each elevated 1 cm. from the bladder mucosa and measuring 1.5 cm. in diameter and implanted on broad bases were noted on the roof of the bladder neck, extending into the bladder proper. The left ureteral orifice was normal in size, shape and position and clear urine was seen to appear from it at regular intervals. Two papillary tumors with narrow stalks each 3 mm. in diameter were seen just beyond the left ureteral orifice. Bi-manual examination revealed no evidence of extra-vesical fixation of the bladder in any of the areas described. Transurethral resection of the above tumors well into the



Fig. 2. (R. J.) Ten-minute film of the preoperative excretory urographic series, February 11, 1958, showing normal upper urinary tracts and multiple filling defects in the urinary bladder produced by tumor, and a filling defect of an indwelling Foley bag catheter.

Fig. 3. (R. J.) Five-minute film of the excretory urographic series, fifteenth postoperative day showing normal upper urinary tracts.

Fig. 4. (R. J.) Five-minute film of the excretory urographic series two months postoperatively showing well-filled, well-outlined normal upper urinary tracts.

detrussor muscle and beyond the edges of the bases was done. The areas were thoroughly fulgurated.

Pathology Report.—Clinical diagnosis of papillary transitional cell carcinoma grade II of the urinary bladder. *Gross:* The tumors were submitted as separate specimens, a total of approximately 5 gm. of irregular papillary fragments of pale grayish fragments of tissue measuring up to 8 to 10 mm. in diameter. *Microscopic Section:* Showed very cellular tumors of transitional type epithelium with marked irregularity of the cells and occasional mitotic figures and invasion into the underlying sub-mucosa. Definite areas of recent hemorrhage and also of necrosis were noted in all sections. Most of the tissue showed a general uniformity of histologic structure. The basal margins of the tumors were well demarcated in most instances although a few areas showed definite infiltrative type of growth into the bladder surface of the detrussor muscle.

Final Diagnosis: Papillary transitional cell carcinoma of the urinary bladder grade II.

Postoperative Course.—The patient tolerated the procedure well and on the fifth postoperative day a repeat cystoscopic study was done. Findings at this time were as noted above with the exception that the tumor areas had been resected and there was fulguration necrosis present in all areas. The good general physical condition of the patient and his age were considered and coupled with a review of the pathological studies it was felt that a radical cystectomy with urinary diversion was the procedure of choice. The patient did not wish to have fecal or urinary orifice on the abdominal wall and it was elected to attempt a Gersuny type operation.

The preoperative blood urea nitrogen was 12 mg. per cent, creatinine 1.6 mg. per cent, CO_2 combining power 25.8 milliequivalents per liter, serum chlorides 94 MEq./l., serum sodium 142 MEq./l. and serum potassium 4.2 MEq./l.

A proctoscopic study was normal. Air contrast colon study demonstrated no abnormalities.

On February 25, 1958, a prostatoseminalvesiculocystectomy with a Gersuny type disposition of the ureters and colon was accomplished in eight hours and forty minutes.

Pathology Report.—Gross: The specimen from a total cystectomy measured 9x5x5x4 cm. The bladder mucosa was shrunken and irregular with multiple areas suggesting tumor infiltrate or recent surgical fulguration. Multiple sections through the wall of the bladder revealed no evidence of infiltration in the muscle wall and several irregularities in the mucosa were taken for section from the sites of the previous resection. *Microscopic:* Section through the tumor areas showed evidence of recent transurethral resection with rather heavy fulguration and marked necrosis of the tissue. In one area of the urinary bladder on the right lateral wall there was infiltration of tumor into and partially replacing a portion of the muscle wall, but only invading a millimeter and not penetrating through the entire muscle wall of the bladder. The remainder of the sections showed only superficial alteration of the mucosa with no penetration into the muscle wall. Perivesical and pelvic lymph nodes showed no evidence of neoplasm.

Final Diagnosis: Papillary transitional cell carcinoma of the urinary bladder, grade II.

The patient's postoperative course was satisfactory.

The second stage revision operation was done on the ninth postoperative day. The ureteral catheters were removed on the seventh postoperative day and the "rectal bladder" catheter was removed on the tenth postoperative day. Diurnal urinary control was excellent and the patient noted sensation of filling of the rectal bladder with an urge to urinate at approximately one-hour intervals during the day and every two hours at night. On the fourteenth postoperative day, the patient was catheterized for residual urine and approximately 140 cc. of urine was obtained. An excretory urographic series was done on the fifteenth postoperative day and showed normal upper urinary tracts (Fig. 3). The patient had some difficulty in controlling the fecal stream initially because of diarrhea, presumably induced by the use of the antibiotics, however when this was controlled and at the time of his discharge on the twentieth postoperative day, he noted a normal sensation of filling of the rectum and was able to empty a part of the rectal contents with defecation effort and the remainder by a small tap water enema.

Serum patterns of electrolytes were done on the second, eleventh, and nineteenth postoperative days and were normal in all respects for each series of determinations.

The patient was seen on the twenty-seventh postoperative day and stated that the fecal stream control was satisfactory, and that the urinary stream control was not as satisfactory as at the time of discharge in that he had noted occasional nocturnal enuresis. Residual urine was 45 cc., and a moderate pyuria was present. The tidal volumes of each voiding were within the normal range, and the pattern of voidings throughout the twenty-four-hour period was similar to that prior to cystectomy.

Second Admission.—The patient was re-admitted to the hospital on April 21, 1958, after experiencing a sudden chill with fever to 104° F. There was no evidence of renal tenderness at the time. The urinalysis showed only 12 to 15 white blood cells and an occasional red blood cell. No abnormalities were found to account for the fever and chill. An excretory urographic series on April 24, 1958, showed excellent function bilateral with no evidence of stasis or dilatation of the ureters, pelves or renal calyces, and the pyelograms were interpreted as normal (Fig. 4).

Third Admission.—The patient was admitted on July 6, 1958, at which time an excretory urographic series showed no change from the last previous examination on April 24, 1958. The serum electrolyte pattern was normal. The urinalysis showed 8 to 10 white blood cells per high power field. Examination of the rectal pouch with a No. 21 French Brown-Buerger cystoscope revealed a normal anal orifice with normal sphincteric control. There was a tortuosity in the lower third of the rectum or new bladder, consistent with the usual contour of the rectum. The rectal folds were normal except for a minimal generalized hyperemia from the presence of urine. The urine itself was clear with some excess mucus within the deep mucosal folds. The capacity of the new pouch was approximately 10 oz. (Fig. 5). On either side of the proximal mid-lateral walls of the rectum could be seen two elliptical ureteral orifices from which clear urine appeared at regular intervals. Chromocystoscopy with indigo carmine showed vigorous jets of the dye-stained urine from the orifices.



Fig. 5. (R.J.) Left oblique cystogram showing the rectosigmoid bladder five months postoperatively.

A rectogram exposure made after instilling 10 oz. of 15 per cent Skiodan failed to show any evidence of reflux to the upper tracts on the initial filling, and a second, made after defecation effort also showed no evidence of reflux (Fig. 6). The serum electrolyte pattern was normal. The patient was discharged on July 8, 1958.

The patient has been seen intermittently in the office since and the residual urine has been approximately 10 to 20 cc. at each visit. An occasional erythrocyte, 7 to 12 leukocytes and an occasional clump of bacteria per high power field have been observed. Urine cultures have showed an occasional growth of *E. coli* but otherwise have been sterile. The patient has excellent control of both the urinary and fecal streams and has returned to his position as an executive in a plastic firm, carrying out his duties without difficulty. The patient has experienced normal sexual relations since the fourth postoperative month.

Case 2 (J. P.—Age: forty-four).—Admitted to the hospital on May 16, 1957, with the complaint of "coffee colored urine" noted intermittently for three days, two weeks prior to admission. The patient had observed two previous similar episodes, the first six months prior to admission with a duration of one day, and the second, one month prior to admission for two days. There was some mild increase in urinary frequency during the week prior to admission. No dysuria, nocturia, chills, fever, costovertebral angle tenderness or decrease in the caliber and force of the urinary stream was noted. Bilateral

contusion of the testes twenty years prior to admission was the only prior genito-urinary tract history. Complete review by systems was negative with the exception of bilateral varicosities of both lower limbs.

Physical examination revealed an alert, well developed, well nourished, cooperative white male with a



Fig. 6. (R. J.) Retrograde rectogram made five months postoperatively showing the configuration of the recto-sigmoid bladder and no evidence of reflux to the upper urinary tracts.

normal temperature, pulse, respiration and blood pressure. No abnormalities of the head, neck, heart, lungs and chest were noted. Examination of the abdomen was normal. Normal male genitalia were noted. The prostate was found to be symmetrical and of normal size, shape and consistency and without tenderness or induration, and no supra-prostatic abnormality was found. The remainder of the rectal examination was normal. Bilateral varicosities of the long saphenous veins were noted with moderate stasis pigmentation present over the anterior aspect of the left lower leg.

Laboratory Findings.—The hemoglobin was 16 gm., 10,250 leukocytes with 67 per cent polymorphonuclear, 32 per cent lymphocytes and 1 eosinophil. The serology was negative. The blood type was O Rh positive. Sedimentation rate was 28 mm. in one hour. The urine was grossly clear amber with a pH of 5.5, specific gravity 1.018, one plus albumin, negative sugar and acetone, and 25 to 30 leukocytes and 25 to 30 erythrocytes per high power field on microscopic study. The urine culture was negative.

Admission chest film showed no abnormalities. An excretory urographic series on May 16, 1957, showed no abnormalities on the preliminary film prior to injection of contrast material. After injection of 22 cc. of 30 per cent Urokon, the excretion rate of the contrast material was normal bilateral, with no abnormalities noted in either kidney or ureter. Two well-defined filling defects, each approximately 2 cm. in diameter, were noted in the urinary bladder—one situated in the left inferior lateral aspect and the second in the left lateral aspect of the bladder (Fig. 7).

Cystoscopic examination on May 17, 1957, using penthothal, curare, nitrous oxide and oxygen anesthesia revealed a normal external urethral meatus, distal and proximal urethra, and prostatic urethra. The bladder urine was clear amber, grossly. There was no evidence of intravesical calculus, foreign body or diverticulum. There was a considerable amount of edematous reaction close to the urethra and vesical neck, particularly on the floor on the left side. It was difficult to determine whether this was a simple inflammatory reaction secondary to a tumor process or extension of a tumor. Both ureteral orifices were normal in size, shape and position and clear urine appeared from each at regular intervals. A large papillary friable tumor mass was situated on the posterior-superior portion of the urinary bladder to the left of the midline measuring approximately 3 cm. in diameter. On the mucosa surrounding this area were a number of dilated, tortuous veins. There was a similar friable papillary tumor mass situated on the left wall of the bladder just beyond the left ureteral orifice extending up the lateral wall of the bladder to 1:00 o'clock on the circumference of the bladder. Both tumors appeared to have broad bases measuring approximately 1 to 1.5 cm. in diameter and were elevated 1 to 1.5 cm. from the mucosal surface. Rectal and bi-manual examination did not reveal any evidence of fixation or extension of the growth into, or through, the bladder wall. Transurethral resection of the tumors into the detrussor muscle and beyond the edges of the bases of the tumors was done and the areas were thoroughly fulgurated.

Pathology Report. — Clinical diagnosis of papillary transitional cell carcinoma grade II of the urinary bladder. *Gross:* 10 gm. of irregular papillary fragments of pale, grayish firm fragments of tissue measuring up to 1 cm. in diameter and 1 cm. in thickness were submitted for analysis. *Microscopic Section:* Showed a very cellular tumor of transitional epithelium joined in large blunt folds from the surface of the sub-mucosal connective tissues. There was uniformity in most of the histologic structure although mitotic figures were found relatively frequently at the base areas. Basal margins of the tumor were quite well demarcated although in a number of areas there was definite infiltrative type of growth into the bladder surface of the detrussor muscle.

Final Diagnosis: Papillary transitional cell carcinoma of the bladder, grade II.

Postoperative Course.—The patient tolerated the procedure well, however on the eighth postoperative day he developed pain in the right anterior chest, an elevated temperature, and a thrombophlebitis was found in the left thigh and lower leg. It was the impression that the patient had a pulmonary embolism, and this was confirmed by radiographic studies. Surgical consultation suggested a bilateral high saphenous ligation on the

thirteenth postoperative day. The patient's postoperative course thereafter was uneventful and he was discharged on the nineteenth postoperative day.

Second Admission.—The patient was re-admitted on September 4, 1957, and on September 6, 1957, a recheck cystoscopy revealed the left ureteral orifice slightly distorted by scar tissue from the previous resection. Just lateral to the left ureteral orifice on the roof of the intra-luminal portion of the ureter was a 2x4x4 mm. nodule of tissue which resembled a recurrent area of carcinoma. The scar from the previous transurethral resection could be seen on the posterior-superior wall of the urinary bladder and no recurrence was present. The left lateral wall was well scarified, except for one area of edema, 3 mm. in diameter, at 3:00 o'clock, which was suspicious of recurrence. The areas were resected and the bases throughly fulgurated. The microscopic study showed irregular masses of transitional epithelium with considerable pleomorphism and an occasional mitosis with infiltration to the deeper portions of the resection area. Changes were limited to the submucosa and mucosa without evidence of extension into the detrussor muscle. A diagnosis of transitional cell carcinoma grade II was made, and was similar in all respects to the first sections. The patient's postoperative course was satisfactory and he was discharged on the fifth postoperative day (Fig. 8).

Third Admission.—The patient was re-admitted on December 5, 1957, and a cystoscopy on December 6, 1957, again showed the distortion of the left ureteral orifice. There was an irregular well-scarified area in the bladder at the site of the resection on the left lateral wall with evidence of recurrent tumor. There was a well-healed scar on the posterior-superior wall of the bladder without recurrence of tumor in this area. Lateral to, and beyond the right ureteral orifice was a small papillary tumor measuring 4 mm. in diameter on a narrow pedicle, which was resected transurethrally and the surrounding tissue fulgated. Microscopic study showed transitional epithelium with an irregular pattern and mild cellular pleomorphism suggestive of transitional cell carcinoma. No mitotic figures were seen, but with the previous history, it was regarded as a papillary carcinoma of low grade malignancy (grade I). He was discharged on the sixth postoperative day.

Fourth Admission.—The patient was re-admitted on March 16, 1958, for a recheck cystoscopic study. The left ureteral orifice was more contracted and distorted than previously noted. Several recurrences of papillary carcinoma were seen: (1) 3x4 mm. in diameter medial to the right ureteral orifice, (2) 3x5 mm. in diameter situated on the roof of the intra-mural portion of the right ureter, (3) 3x5 mm. in diameter anterior and adjacent to the scar on the left lateral wall, (4) 4x4 mm. in diameter internal to the vesical neck at approximately 1:00 o'clock, (5) two tumor areas on the posterior-superior wall adjacent to the cystoscopic bubble each measuring 6x8 mm. in diameter, (6) 10x12 mm. in diameter on the roof of the bladder just internal to the vesical neck at the 12:00 o'clock position. Each recurrence was resected transurethrally and the base and surrounding area fulgated. The nodules were submitted separately for examination. The bladder, on bimanual palpation, at this time showed no evidence of induration, or suggestion of fixation to any of the surrounding structures, or to the lateral pelvic walls. The microscopic report of the representative sections showed transitional cell carcinoma grade II identical with the tissue obtained at the first and second resections.

Final Diagnosis: Papillary transitional cell carcinoma of the urinary bladder grade II with a rare section showing superficial invasion into the detrussor muscle.

The rapidity with which this patient developed recurrences of carcinoma of the urinary bladder suggested that transurethral resection and fulguration was not sufficient to provide a cure or control of the process. His good general physical condition, in spite of a pulmonary embolism, and our inability to cope with the recurrence of tumors by transurethral means warranted a radical cystectomy with urinary diversion. The patient did not wish to have a fecal or urinary orifice on the abdominal wall, and a Gersuny type operation was advised. The preoperative hemogram was normal in all respects, sedimentation rate was 23 mm. in one hour, blood urea nitrogen 16.5 mg. per cent, creatinine 1.9 mg. per cent, CO_2 combining power 21.8 mEq./l., serum sodium 140 mEq./l. The chest film was normal. Air contrast colon study was normal. The proctoscopic study showed mixed hemorrhoids grade I. On March 26, 1958, a prostatoseminalvesiculocystectomy with a Gersuny type disposition of the ureters and colon was accomplished in seven hours and twenty minutes.

Pathology Report.—Gross: The specimen from a total cystectomy measuring 13x5x6.5x5 cm. The bladder was open through the urethra and anterior aspect with the incision extending over the dome. The exposure of the mucosal surface revealed diffuse edema of the interureteric ridge and the areas of the previous transurethral procedures both old and recent were seen. *Microscopic:* Sections of the areas through the resected papillary tumors as well as random sections in various areas of the mucous membrane showed no tumor present. There was no neoplastic change in the muscularis of the bladder. Random sections of the bladder mucous membrane showed an unusual morphological appearance in that it was much more basophilic than normally seen, and there was general immaturity of the epithelium suggesting a generalized dysplasia. There was no extension of the neoplasm beyond the limits of the bladder wall. Peri-vesical and pelvic lymph nodes showed no neoplasm.

Final Diagnosis: Papillary transitional cell carcinoma of the urinary bladder grade II.

The patient's postoperative course was satisfactory. The revision operation was done one week following the Gersuny procedure. The ureteral and rectal bladder catheters were removed on the tenth postoperative day. Diurnal urinary control was excellent but he was

enuretic two to three times each night. On the twelfth postoperative day the patient was catheterized for residual urine and approximately 80 cc. of urine was obtained. An excretory urographic series was also done on the twelfth postoperative day and showed a moderate right hydronephrosis and a normal left upper urinary tract. (Fig. 9). The patient had some difficulty initially in controlling the fecal stream, but it gradually improved and was complete on the day of his discharge, the twenty-fifth postoperative day. Serum patterns of the electrolytes were done on the fifth, tenth and twentieth postoperative days and except for a very



Fig. 7. (J. P.) *(upper left)* Fifteen-minute film of the preoperative excretory urographic series May 17, 1957, showing normal upper urinary tracts and filling defects produced by multiple carcinomas of the urinary bladder.

Fig. 8. (J. P.) *(upper right)* Eighteen-minute film of the excretory urographic series of September 5, 1957, showing faintly-filled but normal upper urinary tracts and the absence of previously noted large filling defects in the urinary bladder. This series was made prior to the second transurethral resection.

Fig. 9. (J. P.) *(lower left)* Five-minute film of the excretory urographic series, twelfth postoperative day showing normal left upper urinary tract, and calyectasis and pelviectasis of the right kidney consistent with a moderate hydronephrosis.

Fig. 10. (J. P.) *(lower right)* Ten-minute film of the excretory urographic series sixty-six days postoperatively showing well-filled and well-outlined upper urinary tracts with some minimal dilatation of the right renal pelvis and calyceal system, and a normal left upper urinary tract.

minimal increase in the blood urea nitrogen to 21.7 mg. per cent on the fifth postoperative day, the remainder of the serum pattern remained well within normal limits.

The patient was seen on the thirtieth postoperative day and stated that since he had been at home the fecal stream control was only fair, and that the sensation of defecation and rectal fullness was not as complete as noted just prior to discharge. The urinary stream was in complete control except for an occasional episode of nocturnal enuresis. The tidal volumes of each voiding were within normal range, and the pattern of the voidings throughout the twenty-four-hour period was similar to that prior to cystectomy. The residual was found to be 15 cc. and a mild leukocyturia was present. On the fifty-sixth postoperative day the serum pattern of the electrolytes was normal, the voiding pattern was normal, and the bowel control was much improved but with considerable constipation which was fairly well controlled by small daily rectal irrigations.

Fifth Admission.—Re-admitted May 30, 1958, for a re-evaluation at which time the serum electrolyte pattern was within normal limits. An excretory urographic series on May 31, 1958, revealed no abnormalities on the preliminary film and after injection of the contrast material prompt appearance was noted bilateral. Both kidneys were normal in architecture, and some minimal dilatation of the right ureter was demostrated (Fig. 10 and 11). The mild leukocyturia was still present and the residual urine was 40 cc. He was discharged on the fourth hospital day.

Sixth Admission.—The patient was re-admitted on August 28, 1958. The residual urine was found to be 40 cc. and 10 to 20 leukocytes were found per high power field. Examination of the rectum was a No. 24 French McCarthy Pan-Endoscope was made and demonstrated a very minimal reaction of hyperemia of the mucosa to the contained urine. Rectal pouch capacity was 360 cc. Indigo carmine was given intravenously and although neither orifice could be definitely completely visualized, two areas in the proximal-lateral folds of the rectal mucosa were visualized from which indigo carmine was seen to appear promptly and in good concentration. An excretory urographic series showed a normal left upper urinary tract and a marked decrease in the dilatation of the right upper urinary tract (Fig. 12). A rectogram was made with 300 cc. of 15 per cent skiodan and failed to show any evidence of reflux on the initial filling, and a second exposure made after defecation effort also showed no reflux (Fig. 13). The serum electrolyte pattern was normal. The patient was discharged on the third hospital day with a supply of amphetamine sulfate, 10 mg. spansules to attempt to control the enuresis.

The patient has been followed since discharge and has noted a definite improvement in the nocturnal enuresis from the use of amphetamine sulfate. A mild leukocyturia persists and the residual urine ranges from 30 to 45 cc. The control of the urinary and fecal streams is excellent. The tidal volumes of urine and the voiding pattern approach approximately normal. He has returned to his work as a auto body shop manager and carries out his work as he did prior to surgery.

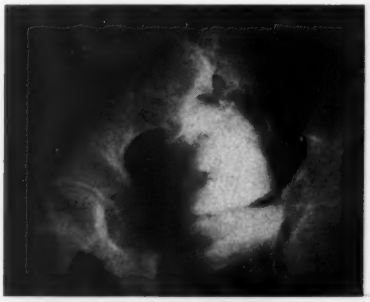


Fig. 11. (J. P.) Left oblique cystogram showing recto-sigmoid bladder, 66th postoperative day.

Comment

It is our feeling that the Gersuny operation provides the patient with carcinoma of the urinary bladder or other condition in which urinary diversion is required with an:

1. Expected average longevity.
2. A satisfactory solution to the surgical condition of the urinary diversion.
3. It fulfills the three essential conditions required to make urinary diversion an ideal operative procedure in that it: (1) Provides for correction of the primary pathological problem or disease. (2) Provides the mechanisms for preservation of normal renal function and most important, (3) Provides the patient with continence of the urinary and fecal streams.

This procedure is ideally suited to the male patient, however it can be performed in the female as well, although we have had no experience with this.

The rectal reservoir for urine, although initially unsterile, eventually becomes a container of sterile urine and because of the absorptive qualities of the bowel in this region, there should be practically no interference with fluid and electrolyte balance. With a potentially sterile urine and practically no absorption from this bowel segment, obstruction to urine flow and pyelonephritis should be avoided, and initially normal upper urinary tracts should remain so after this procedure has been performed. The fecal stream has been diverted from the bowel reservoir and the problem of increased bowel pressures during defecation as in ureterosigmoidostomy is also avoid-

ed. The bowel reservoir for the urine can be emptied frequently under voluntary control and the same situation exists with regard to the bowel reservoir for the fecal material. The orifices



Fig. 12. (J. P.) Ten-minute film of the excretory urographic series five months postoperative showing decrease in the dilatation of the right upper urinary tract. Normal left upper urinary tract with no change from previous studies.

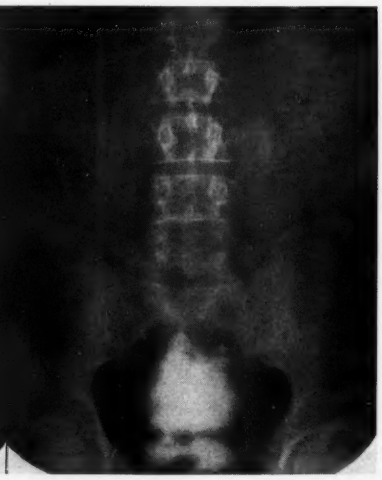


Fig. 13. (J. P.) Retrograde rectogram made five months postoperatively showing the configuration of the rectosigmoid bladder and no evidence of reflux to the upper urinary tracts.

are in a "natural" anatomical location and do not require the use of a collecting apparatus. The advantages over cutaneous ureterostomy, ureterosigmoidostomy, isolated segment of cecum, isloated segment of ileum are obvious. This operation is but a refinement of a diversion to the isolated rectosigmoid with diversion of the fecal stream by an abdominal colostomy, and avoids the use of a colostomy.

The three most popular methods of urinary diversion at this time are the ileal segment diversion, the isolated rectosigmoid with diversion of the fecal stream by abdominal colostomy, and now the Gersuny operation. The patient and his physician are faced with the problem of urinary incontinence from a stoma in the abdominal wall and collection of the urine by an appliance in the first instance, the use of a colostomy in the second instance, and in the Gersuny procedure, by a perineal colostomy with control and a urinary reservoir also with voluntary control, but with both orifices in a "natural" anatomic location. The latter would seem to be the more logical procedure of choice by both physician and patient.

The basic principles of ureteral and intestinal surgery must be fulfilled by any method of urinary diversion to avoid localized necrosis at the suture line of the anastomosis, leakage, peritonitis, etc. The vascular supply of the ureter must be preserved and during the procedure must not be twisted, traumatized or angulated. The exposure afforded by this method should, with careful technique of the operator, provide the most ideal situation for a ureteral-intestinal anastomosis.

The patient should have voluntary control of the urine almost immediately upon removal of the indwelling urinary reservoir catheter. Normal urge to empty the reservoir will occur immediately as soon as it begins to fill with urine. The capacity of the urinary reservoir will vary, but most ideally should be about 300 cc. with little or no residual after emptying. The voiding pattern should approach that of a normal voiding pattern of a normal urinary bladder with the voiding volumes approximately the same. The control of the fecal stream requires somewhat longer after the revision operation is done, but should be present in approximately two weeks. The new fecal reservoir should be emptied daily and is assisted by a small daily irrigation. The patient will develop a normal urge of bowel movement but will encounter some difficulty with control of flatus initially; this also becomes controlled with time.

As in all radical pelvis surgery on the male,

impotence is a problem and particularly after a cystectomy has been performed. One of the cases noted has had no problem in this regard.

The urine cell count initially will be very high, but as the bowel becomes adjusted to the contact with urine and the bacterial density becomes less, the urine becomes sterile with the aid of antibiotics and other chemotherapeutic agents.

There is no question that some electrolyte absorption does occur from the isloated rectal bladder (Boyce[14,15]), but normal or nearly normal function should offset this reabsorption.

Excretory urographic series will demonstrate normal upper urinary tracts in those patients with a normal urinary tract prior to surgery and an improvement in urinary tracts which have been dilated prior to surgery. The rectal bladder may assume a rather bizarre shape radiographically when filled with contrast material and an estimate of the amount of residual urine in the reservoir can be demonstrated by making an oblique cystogram of the contrast-filled pouch before and after the patient has voided.

Rectograms made with an inlying catheter in the rectal bladder and injecting the amount of contrast material estimated to be that of the capacity of the reservoir can be easily accomplished and a retrograde reflux rectogram made shortly after injection and again after removal of the tube and after the patient has emptied the new rectum, will show uretero-renal reflux if reflux is present.

Cystoscopic examination of the isloated rectum can be easily accomplished as an office procedure with no discomfort to the patient and the ureteral orifice can be visualized by chromocystoscopy after injection of indigo carmine.

Early diagnosis and subsequent early operation by this method of the select patient with carcinoma of the bladder or other surgical conditions of the bladder, should provide the patient with a situation which is economically and socially feasible for comfortable survival. This method should encourage more radical procedures in an earlier stage of the disease with a more satisfactory end result than other methods of urinary diversion.

Summary

1. Two cases of carcinoma of the urinary bladder in relatively young men treated surgically by the Gersuny operation with modification of the proctologic surgical technique are presented.

2. Principles of urinary diversion and their basis on the historical background of urinary diversion are reviewed with particular reference to this procedure.

3. The technique used in the two cases is outlined in detail as well as the immediate and late postoperative care.

References

1. Gersuny, R.: Reported by Foges.[8]
2. Hinman, F., and Weyrauch, H. M., Jr.: A clinical study of different principles of surgery which have been used in ureterointestinal implantation. Tr. Am. A. Genito-Urin. Surgeons, 29:15-156, 1936.
3. Johnson, T. H.: Further experiences with a new operation for urinary diversion. J. Urol., 76:380-386, 1956.
4. Lowsley, O. S., Johnson, T. H., and Rueda, A. E.: A new operation for diversion of the urine with voluntary control of feces and urine, preliminary report. J. Internat. Coll. Surgeons, 20:457, 1953.
5. Lowsley, O. S., and Johnson, T. H.: A new operation for creation of an artificial bladder with voluntary control of urine and feces. J. Urol., 73:83, 1955.
6. Bricker, E.: Substitution for urinary bladder by use of isolated ileal segments. S. Clin. North America, 36:117-1130 (Aug. 1) 1956.
7. Merricks, J. W., Gilchrist, R. K., Hamlin, H., and Rieger, I. T.: Substitute bladder and urethra, using cecum as bladder and ileum as urethra. J. Urol., 65:581-584 (April) 1951.
8. Foges: Proceedings of K. k. Gesellschaft der Ärzte in Wien. Wien. klin. Wchnschr., 11:(43)990, 1898; Centralbl. f. Chir., 26:497, 1899.
9. Poth, E. J.: Intestinal antisepsis in surgery. J.A.M.A., 153:1516, 1953.
10. Scott, William Wallace: Urologic and physiologic aspects of ureteral transplantation. Am. J. Obst. & Gynec., 68:1301.
11. Skanse, B., and Widen, T.: Potassium dificiency syndrome following bilateral ureterosigmoidostomy. J. Urol., 73:62-66 (Jan.) 1955.
12. Smith, G. I., and Hinman, Frank, Jr.: The rectal bladder, colostomy with ureterosigmoidostomy, experimental and clinical aspects. J. Urol., 74:3-354 (Sept.) 1955.
13. Kiefer, J. H., and Lienke, C.: Ureterorectostomy and pre-anal colostomy for bladder exstrophy. J. Urol., 79:242, 1958.
14. Boyce, W. H.: Reabsorption of certain constituents of urine from the large bowel of the experimental animal. J. Urol., 65:241, 1951.
15. Boyce, W. H., and Best, S. A.: The role of ammonia reabsorption and acid base imbalance following ureterosigmoidostomy. J. Urol., 67:169, 1952.
16. Kinman, F. M., Sauer, D., Houston, B. T., and Melik, W. F.: Substitution of the excluded rectosigmoid colon for the urinary bladder. A.M.A. Arch. Surg., 66:531, 1952.
17. Mauclaire: Ann. d. mal. d. org. genito-urin., 13: 1080, 1895.
18. Creevy, C. D.: Some observations upon absorption after ureterosigmoidostomy. J. Urol., 70:196-202, 1953.
19. Maydl, K. J.: Ueber die Radikoltherapie der Ectopia Vesicae Urinariae. Wien. med. Wchnschr., 44: 1169; 1209; 1256; 1297, 1894.
20. Stonington, O. G., and Eisman, B.: Perineal sigmoidostomy in cases of total cystectomy. J. Urol., 76:74, 1956.

Primary Hepatoma: Bone Metastasis as Initial Manifestation

The authors add one more consideration in the diagnosis of a patient who has lytic osseous metastases without evident primary tumor.

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NUMEROUS NECROPSY analyses have confirmed accepted medical opinion that primary hepatomas are rare.[1-7] This is true in spite of the fact that the liver is the site of more secondary neoplasms than any other organ, due to its size, blood supply, and location.[8]

It is not the purpose of this paper to discuss the pathology of hepatomas. Instead, it is the purpose of this discussion to emphasize that, in spite of their rarity, hepatomas are responsible for bone metastases of the lytic type which may have a loculated expanding configuration.[1,3,9-13] Unlike the majority of reported hepatomas, the case in question showed no evidence for cirrhosis either ante or postmortem.[2,6,8,10] Thus, the diagnosis must be considered by the roentgenologist when searching for the cause of lytic and/or loculated bone lesions (Figs. 1-4).

In Asia, and to a lesser extent in Europe, where cirrhosis is relatively more frequent,[8] hepatomas are more prevalent. In this country several surveys[1,3-7] quote the incidence of primary hepatomas as less than 1 per cent in thousands of autopsies. The records of the Boston City Hospital[6] show that the incidence of hepatomas has increased with the increasing number of cases of cirrhosis. In the many thousand necropsy series, the incidence of bone metastases varies between 1 to 3 per cent. In the reports pertaining to bone lesions as such, these figures do not apply, for these are selected surveys.[12,14-15]

Case Report

The patient was a white woman, aged sixty-three. In 1954 she was admitted for a simple Colles fracture. In June 1956, she was readmitted for low back, pelvis, and hip pain associated with depression. She had chest pain which in retrospect was due to a rib fracture. Physical examination and multiple laboratory studies including urine for Bence Jones protein, cerebrospinal fluid examination, blood sugar, calcium, phosphorus, serum protein determinations, and electrophoretic serum protein patterns were all negative. Roentgen evidence for osteoporosis, which was non-specific, was present. This had increased perceptibly in two years. She was subsequently treated with estrogens and testosterone.

The patient was readmitted on December 19, 1956, after suffering trauma to the head and neck. Since her last admission she had been well, in spite of the fact that she had discontinued her medication. The spinous process of D1 (Fig. 1-2) was fractured and showed poor definition of the break suggesting a pathologic fracture. Chest findings showed hilar, especially left, enlargement over the past six months. For the first time, a small left axillary lymph node was palpable and proved to contain metastatic carcinoma, primary site unknown. Further search showed an enlarged left supraclavicular node.

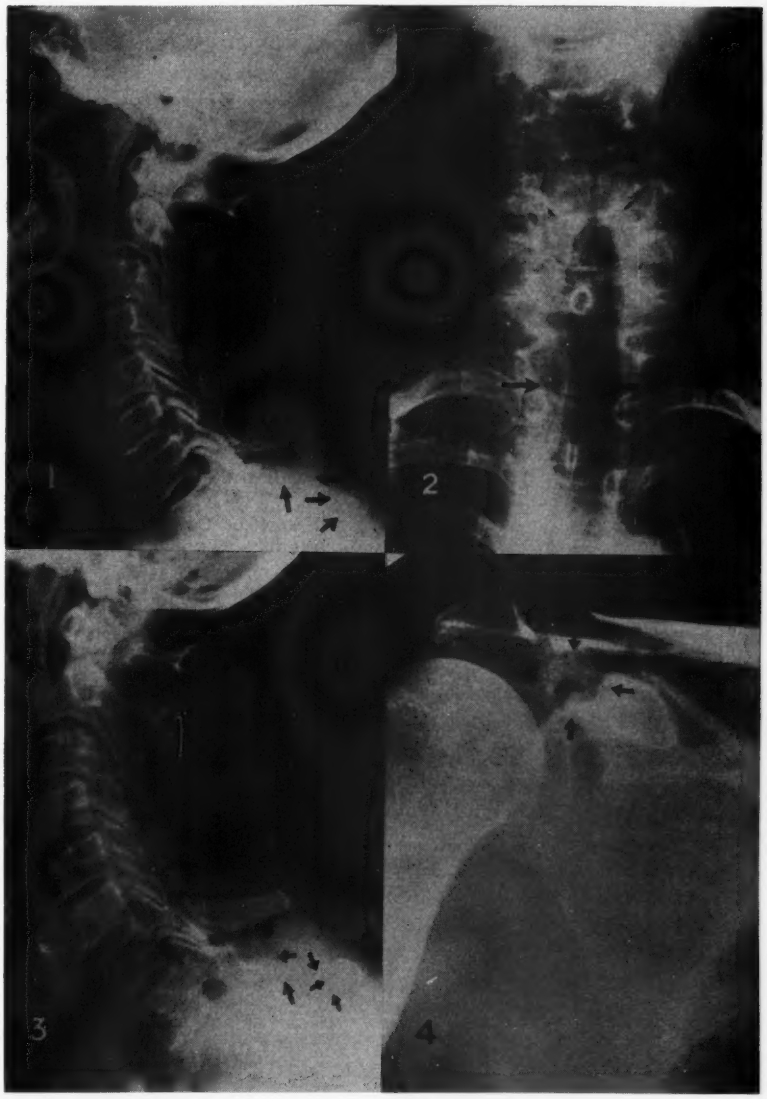


Fig. 1. Lateral cervical spine study taken in December 1956. Pathological fracture through spinous process of D1 with indistinct margins due to underlying lytic lesion.

Fig. 2. Anteroposterior view showing poorly defined spinous process as seen *en face* due to above-mentioned findings.

Fig. 3. Pathologic fracture through D1 relatively unchanged since December 1956 as seen on May 1958. The only change has been the degree of osteoporosis which has increased.

Fig. 4. May 1958 examination of right shoulder showing partially healed cystic, lytic neoplastic changes at base of coracoid process of scapula.

While living in San Francisco, she developed a lytic right scapular lesion which showed some response to

radiotherapy. In December 1957, she developed abdominal pain, leg pain, fatigability, and frequent bouts of perspiration.

On May 12, 1958, she was admitted again because of vertigo and cervical and interscapular pain. Physical examination showed a right submaxillary node, moderate hepatomegaly, and questionable jaundice. Bilirubin was 1.3 mg. per cent at one minute; the total being 2.8 mg. per cent. Bromsulphalein test was 66 per cent and the alkaline phosphatase level was 41 KA (King Armstong) units. Roentgen findings were limited to osteoporosis, destruction of the spinous process of D1, (Fig. 3), and partially healed cystic metastasis in the right scapula (Fig. 4). The old bilateral hilar enlargement, especially left, persisted. Gastric studies showed large liver and spleen indentations. Treatment consisted of cortisone, nitrogen mustard, and dilaudid.

Her last admission was on June 27, 1958. She was markedly jaundiced and was distended. The hepatomegaly had increased. She had pretibial edema. Renal function was diminished. Her sedimentation rate was 64 mm. per hour, serum bilirubin was 5.95 mg. per cent in one minute with a total of 10 mg. per cent, and prothrombin time was 69 per cent. She became comatose on June 31, 1958, and died on August 2, 1958.

Autopsy.—Gross pathology showed carcinomatosis, primary undetermined. Liver, spleen, lungs, mediastinal and peribronchial nodes, celiac and periaortic nodes, adrenals, dura, cerebellum, dorsum sellae, and sella turcica were all involved. The liver was replaced by tumor with intrahepatic biliary obstruction.

Microscopic examination revealed carcinoma in nodules and masses within vascular channels—both lymphatic and blood vessels. There were numerous bile thrombi. The structures varied between glandular and ductal.

Diagnosis.—Primary carcinoma of liver. No evidence for cirrhosis. Metastases to spleen, lungs, mediastinal and peribronchial nodes, adrenals, dura cerebellum, dorsum sellae, and hypophysis.

Discussion

This case emphasizes the difficulty frequently encountered in the diagnosis of hepatoma, from all points of view. In this case, the isolated finding of destructive bone lesions was the only early clue without any clinical or laboratory clue. In spite of several hospital admissions, laboratory studies, including "liver profiles" and numerous roentgen studies, the early positive findings were limited to a post-traumatic dorsal spinous process fracture. When the scapular lesion was discovered, gastric displacement by liver and spleen was already obvious. Hepatomegaly and icterus were late findings as were the positive laboratory findings. The course of events suggested the diagnosis of secondary, rather than primary neoplasm of the liver.

Summary

A case is presented to illustrate the necessity of considering the diagnosis of primary hepatoma in the over-all differential diagnosis, when lytic bone lesions are the only positive findings in an extensive battery of clinical and laboratory studies is presented. Bone metastases are found in a very small percentage of necropsies of patients with hepatomas; nevertheless, one should be aware of this possibility whenever one encounters a lytic and/or loculated bone lesion which cannot be traced to the more common renal, thyroid, bronchial, or the more rare primary sites of carcinoma involvement.

References

1. Bates, J. C.: Carcinoma of the liver with bone metastases resembling multiple myeloma. U. S. Armed Forces M. J., 3:1881-1885 (Dec.) 1952.
2. Bigelow, N. H. and Wright, A. W.: Primary carcinoma of the liver in infancy and childhood. Cancer, 6:170-178 (Jan.) 1953.
3. Carnahan, D. S.: Primary hepatoma with metastasis to a long bone. Radiology, 55:844-847 (Dec.) 1950.
4. Charache. H.: Primary carcinoma of the liver: Report of a case and review of the literature. Am. J. Surg., 43:96-105 (Jan.) 1939.
5. Hoyne, R. M. and Kernohan, J. W.: Primary carcinoma of the liver: Study of 31 cases. Arch. Int. Med., 79:532-534 (May) 1947.
6. MacDonald, R. A.: Primary carcinoma of the liver: a clinicopathologic study of 108 cases. A.M.A. Arch. Int. Med., 99:266-279 (Feb.) 1957.
7. Schupach, H. J., Jr. and Chappel, R. B.: Primary carcinoma of the liver. Arch. Int. Med., 89:436-444 (Mar.) 1952.
8. Edmondson, H. A.: Tumors of the Liver and Intrahepatic Bile Ducts. Washington, D. C.: Armed Forces Institute of Pathology, 1958.
9. Anglesio, E.: Isolated bone metastases as a manifestation of primary tumor of the liver: Report of a case and review of the Literature. Gastroenterology, 27:307-317 (Sept.) 1954.
10. Auerbach, O. and Trubowitz, S.: Primary carcinoma of the liver with extensive skeletal metastasis and panmyelophthisis. Cancer, 3:837-843 (Sept.) 1950.
11. Dick, A., Mead, S. G., Mensh, M., and Schatten, W. E.: Primary hepatoma with metastasis to the mandible. Am. J. Surg., 94:846-850, (Dec.) 1957.
12. Mallory, T. B.: 2 Case records of MGH. New England J. Med., 219:133-135, 1938.
13. Trevathan, R. D.: Primary carcinoma of the liver with early metastasis to spine and initial symptoms of paraplegia. Am. J. Med., 17:432-434 (Sept.) 1954.
14. Spatt, S. D. and Grayzel, D. M.: Primary carcinoma of the liver. Am. J. Med., 5:570-573 (Oct.) 1948.
15. Willis, R. A.: Pathology of Tumors. p. 430-37. St. Louis: C. V. Mosby Co., 1948.

Emotional Problems of Middle Life

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Presented at the 67th Annual Meeting, Association of Life Insurance Medical Directors of America, Hartford, Connecticut, October 23, 1958.

THERE MAY BE specific sources of stress in middle life which make adjustment difficult. Illness, business reversals, rebuffs, disappointments in friends, failures of promotion, loss of face in business or in the community; all of these may threaten the man in middle life much more than they would have done earlier, for now there is a feeling of time moving rapidly and jeopardizing the chance of setting the reversals to right. In the mild depression, which inevitably accompanies any serious set-back, there sometimes arises a period of self-examination which may enhance the depressive mood. The man in middle age examines himself through the dark glasses of discouragement. He finds perhaps that he has to settle for much less than the objectives he once thought essential.

Worse yet, he may find that he has achieved all his goals only to find them empty of emotional satisfactions. Occasionally, a man in middle life will become depressed after having been promoted to the top position in his business or profession. Finding himself alone at this dizzy height and fearing lest he fall, he becomes depressed and anxious. The very successful man of fifty may have accumulated so much wealth, have so many obligations, offices, and memberships that he cannot get off the mad merry-go-round, even when for the sake of his health he needs to take time out. The moderately successful man may drive himself or be driven by his wife or his confreres toward greater and greater accomplishments with the swift passage of time. It is in this group, psychiatrists find, that definite anxieties may arise about a son, or a symbolic son in the person of a young man, who may threaten to displace him at home or in business. Such a man has never resolved certain conflicts with his own parents and he is therefore vulnerable in his role as an elder so that toleration of business rivals and of figures in the family itself may be stressful.

Equally pressed is he of mediocre accomplishment. More than ever he may find it incumbent upon himself to go forth and prove, at least to his

wife and family, that he is somebody important. Failure at this point is particularly bitter. He may well reach outside his family for appreciation and so estrange himself from what should be one of his greatest sources of satisfaction. This only adds to the stress of the middle years.

The emotional reactions to anticipated old age are in themselves a real source of stress. The fear of growing old in our urbanized, industrial age is very real indeed, for it usually signifies to men dependence upon others, loss of privilege, loss of respect and financial duress. Unfortunately, in these days in many positions we are old by fiat of a Board of Directors, as I have frequently stated before. We are capable and employable at sixty-four and old and retired at sixty-five; retired after the customary, honored-guest routine, which to the recipient simply means he is through. All of this is too close to the man in middle life for him to be comfortable, or for him to contemplate it with equanimity.

The emotional symptoms which arise in this life period are usually exaggerations of the normal personality, characteristics which were developed at a much earlier age. When these symptoms become severe and progress to the point where there is a break with reality, the individual is said to have a psychosis. Fortunately, these are relatively rare in men in the involutional period. The break, when it comes, is gradual and it appears because the individual has to accept something as psychologically true. He loses someone or something dear to him, worries, and becomes depressed. He may conclude that life is over for him. Physically, this may not be true, but psychologically, if his "life" was maintained by his investment in the person or thing now departed, then life, as he sees it, is empty.

The feeling of failure now seems overwhelming. Old conflicts revive and there is a decrease of physical strength and loss of the will to continue the battle. No matter what the precipitating cause, the resulting emotions are depression and despair or, if he blames others, delusions of persecution. Attention formerly expended on external interests is now turned on the self, with resultant increase in selfishness, egocentricity and hypochrondriacal preoccupation. Next comes a renunciation of friends and all pleasures, and if this state progresses, the results are sometimes deeper depressions and agitation. The depressions of middle life are no different from other depressions. Fortunately, at present modern psychiatric therapies have dramatically changed the prognosis of these depressions and the period of illness is much shorter than it used to be.

At times, the first evidence of trouble in this age group will be the discovery that the individual is becoming more dependent upon alcohol, for it offers temporary relief. Another group may seek undesirable companionship outside of the home, and still another may respond with hypochondriacal symptoms and a fixation on various organs or systems. We find in these groups many of the men who are thoroughly dissatisfied and unhappy in their professions, their jobs, their specialties, their health, their homes, their relationships and their accomplishments and who fail to recognize that their troubles are due not to their surroundings but to themselves. During this difficult period help rather than criticism is needed. It may be of utmost importance to prevent a man with the syndrome from making a drastic change of employment or marital status until he is free of his symptoms of illness. Should he do so, his last state is not infrequently worse than the first.

Society, in general, fosters a rather dismal outlook for people in their declining years. There is little question that one of our greatest needs is the development of an educational program to train people for adjustment to old age. This program should have the broad aim of anticipating and preventing the anxieties and maladjustments attendant on growing old. Such a program should not be delayed until middle life, it should be a continuing health measure from childhood.

In earlier times, the woman entered middle life with trepidation. Her biologic and her physiologic development made fear a commonplace. For many, this period becomes a time of soul-searching and regret—a period of anxiety, phobias, and fear of waning attractiveness in the tradition of the particular culture. Though much of this has lessened, still to many it is a time of emotional irritability coinciding with changes in the autonomic nervous system and some glandular changes. Psychologically, it is a time of change in the life of a mother who, after a period of arduous duties, now finds herself at comparative leisure. What she does with that leisure is important, as we note on all sides of us.

Emancipation from heavy responsibilities can in some instances result in a vacuum. We have mentioned before that women even more than men need to be needed and, like them also, when their sphere of operation and ministration is severely

restricted, they may be unable to contain their anxiety. It is then that there is danger of neurotic complaints and symptoms appearing. One sees here the need, in fact the necessity, for individuals to have outside interests—the church, the school, the community. Work in these spheres is in itself therapeutic; it prevents what Nietzsche called "the melancholy of everything completed." William James also commented upon this fact when he stated that "the sovereign cause of melancholy is repletion." We need things to do which are important and which give us an emotional return.

Of extreme importance to the normal woman is her concept of herself as a human being and the great dignity which is hers in the natural scheme of things. Since childhood she has learned to cherish ideas of her self-worth and to guard and appreciate her prerogatives. Now in middle age some women feel that this status and these prerogatives are threatened. Life has already poured out its most important gift and the woman may sometimes feel that her personal importance is diminished. In addition, she begins to fear the spectre of old age. Along with the lessening of responsibility there appears at this time an unmistakable increase in fatigability, a gradual loss of family or friends through death and through a variety of circumstances. In some women there also arises the necessity of becoming in some way self-supporting and this fact in itself introduces a whole new set of problems and adjustments. While most individuals handle these problems without too much difficulty, there are some women who become unduly insecure and insecurity is the foundation upon which anxiety and depressive symptoms arise.

If a woman has successfully handled the anxieties of her emotional development in the past, the chances are very good that she will do so again at this period of life. It is only the particularly rigid and unadaptable person who has difficulty when faced with the need for a change in outlook. Variability typifies the situation in women in middle age and it is unjustifiable to attempt to blanket them all into one great group. There are various kinds of personalities, with various kinds of environments and adaptive mechanisms, who meet various kinds of stress, and it is obvious that various kinds of reactions will be called forth.

We should pause here for a moment and consider another myth which has little or no foundation in fact. That is the inevitability of a great increase in weight in middle life. Also thought to be mysteriously connected with glandular change, it is known as "the middle-age spread." The middle-age spread is due to the same reason that spread at other times of life is due—namely the ingestion of too many calories, or to be blunt, to overeating. The proof of this, of course, lies in the fact that not all women are affected in this fashion. If it is pointed out that it occurs frequenly in mothers whose childbearing period is over, it can also be pointed out that they more frequently are prone to cook for the family and hence are more exposed to tasting, sampling and frequent snacks than are their sisters who are employed away from the home.

There is one psychological mechanism or means by which we handle our anxiety which we should mention here, namely, that of projection. Projection is the psychological temptation of shifting to others blame which we should accept ourselves. If this becomes a chronic method of handling problems or if it is indulged in regularly, it will have dangerous possibilities.

In people who are prone to go through life using this mechanism, when periods of stress arise as those about which we have been speaking, here is an easy way to handle it: blame someone. But this is fraught with danger, for it can be carried so far that it occupies one's mind to the exclusion of other means of meeting problems. Projection becomes the basis of paranoia and paranoia implies a series of delusional ideas. Delusions are fixed false beliefs and when they occupy our minds we are in danger of an emotional break. This situation is sometimes seen in middle life and called a paranoid condition. It is better to face up to problems and frankly assay and accept our deficiencies than to fall prey to an illness because we are prone to blame others.

To be mature emotionally implies that we have some knowledge of ourselves and our reactions, that at least we know something about them, particularly those which are weaknesses and those which we must guard against. Without this knowledge or some portion of it, we cannot exercise the control required of us in order to meet the difficulties which beset us. To be thought of as emotionally mature assumes also that we have the capacity to accept the duties and responsibilities of our station in life and that our ideals and our goals are worthwhile and within the realm of attainment. It assumes necessarily that we have learned that the world is not a large catering firm

made for our especial delectation and also that there are other people in the world who have rights equal to our own.

To be emotionally mature means that we evaluate things as they are in reality, not as they appear to us through the rose-colored glasses of fantasy or the bilious glasses of depression and misanthropy. To distort situations because of one's neurotic needs or frustrations is to court trouble. Under this heading we may place our view of our own selves. This should be real, with our various virtues and deficiencies known to us. To feel hopelessly inferior is to be tiresome and to call forth neurotic symptoms. All of us are inferior in some things and superior in others. To feel that we are definitely superior is to be insufferable and a bore. Everyone, sick or well, has an essential dignity and it is required of him that he respect others and respect himself. It is our task to determine our good qualities and our abilities and to develop them. To be emotionally mature means to be able to recognize and deal effectively with the emotional conflicts and tensions which are the lot of most of us. We may require help with some of the more pressing ones or the unconscious conflicts which assail us, but at least we are required to make an effort to handle our problems. It is our unresolved conflicts which are the cause of the symptoms which distress us and which basically are the cause of our maladjustments. The groundwork for them is laid in our early years and some of them come to fruition when we are under stress.

It was written by an old Roman centuries ago that men who have no resources in themselves for securing a good and happy life find every age burdensome (Cicero *De Senectute*).

SURGERY OF THE LYMPHATICS IN CANCER OF THE RECTUM AND SIGMOID COLON

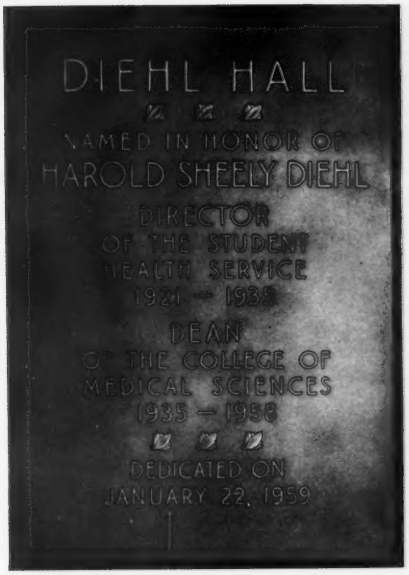
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10. Coller, F. A., Kay, E. B., and McIntyre, R. S.: Regional lymphatic metastases of carcinoma of the rectum. Surgery, 8:294, 1940.
11. Gilchrist, R. K., and David, J. C.: Lymphatic spread of carcinoma of the rectum. Ann. Surg., 108:64, 1938.
12. Gilchrist, R. K., and David, V. E.: Prognosis in carcinoma of the bowel. Surg. Gynec. & Obst., 86:359, 1948.
13. Grinnell, R. S., and Hiatt, R. B.: Ligation of the inferior mesenteric artery of the aorta in resections for carcinoma of the sigmoid and rectum. Surg. Gynec. & Obst., 94:526, 1952.
14. Moynihan, B. G. A.: The surgical treatment of carcinoma of the sigmoid flexure and rectum. Surg. Gynec. & Obst., 6:463, 1908.
15. Miles, W. E. A.: A method of performing abdominoperineal excision for carcinoma of the rectum and terminal portion of the pelvic colon. Lancet, 2:1812, 1908.
16. Gerota, D.: *Quoted by* Sauer, I., and Bacon, H. E.: A new approach for excision of carcinoma of the lower portion of the rectum and anal canal. Surg. Gynec. & Obst., 95:229, 1952.
17. Poirier, P., Cuneó, B., and Delameré, G.: The Lymphatics. Chicago: Keenen and Co., 1904.
18. Villemin, F., Huard, P., and Montagné, M.: *Quoted by* Sauer, I., and Bacon, H. E.[29]
19. McVay, J. R.: Involvement of lymph nodes in carcinoma of the rectum. Ann. Surg., 76:755, 1922.
20. Gabriel, W. E., Dukes, W. C., and Bussey, H. J.: Lymphatic spread in cancer of the rectum. Brit. J. Surg., 23:395, 1935.
21. Ault, G. W., Castro, A. F., and Smith, R. S.: Carcinoma of the upper rectum and rectosigmoid. Postgrad. Med., 8:176, 1950.
22. Ault, G. W.: A technique for cancer isolation and extended dissection for cancer of the distal colon and rectum. Surg. Gynec. & Obst., 106:467, (April) 1958.
23. Rossi, P. A.: Selection of operations for carcinomas of the colon. S. Clin. North America, 34:221, 1954.
24. McElwain, J. W., Bacon, H. E., and Trimpi, H. D.: Lymph node metastases: experience with aortic ligation of inferior mesenteric artery in cancer of the rectum. Surgery, 35:513, 1954.
25. Wood, W. G., and Wilkie, P. D.: Carcinoma of the rectum; an anatomico-pathological study. Edinburgh M. J., 7:321, 1933.
26. Dukes, W. C.: Spread of cancer of the rectum. Brit. J. Surg., 68:64, 1930.
27. Guernsey, D. E.: Waught, J. M., and Dockerty, M. B.: Carcinoma of the rectum: Prognosis based on the distance of the lesions from, or involvement of the levator ani muscle and involvement of the anal sphincters. Surg. Gynec. & Obst., 92:529, 1951.
28. Sauer, I., and Bacon, H. E.: Influence of lateral spread of cancer of the rectum on radicality of operation and prognosis. Am. J. Surg., 81:111, 1951.
29. Sauer, I., and Bacon, H. E.: A new approach for excision of carcinoma of the lower portion of the rectum and anal canal. Surg. Gynec. & Obst., 95:229, 1952.
30. Freidin, J.: The lateral spread of carcinoma of the rectum. The Australian and New Zealand J. Surg., 24:283, 1955.
31. Reinhold, P.: *Cited by* Sauer, I., and Bacon, H. E.[29]
32. Glover, R. P., and Waugh, J. M.: The retograde lymphatic spread of carcinoma of the rectosigmoid region. Surg. Gynec. & Obst., 82:434, 1946.
33. Wagensteen, O. H.: Primary resections (closed anastomosis) of the rectal ampulla for malignancy. Surg. Gynec. & Obst., 81:1, 1945.

Dedication of Diehl Hall

Introductory Remarks

ROBERT B. HOWARD, M.D.
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Diehl Hall was dedicated on January 22, 1959, at a dinner in Coffman Memorial Union.

IT IS A DISTINCT privilege for me to act as your Master of Ceremonies on this occasion when we have come together to honor our friend, Dr. Harold S. Diehl, Dean Emeritus of our College of Medical Sciences.

Before proceeding, please let me introduce guests at the head table: President and Mrs. J. L. Morrill, Dean and Mrs. H. S. Diehl, Reverend and Mrs. George Hall, and Mrs. Howard. With us in the audience are more than seventy-five members of the Legislature of the State of Minnesota; distinguished members of the Board of Regents of the University of Minnesota; Dr. Il Sun Yun of our sister university, Seoul National University; members of the Diehl family; and a host of friends and benefactors of the University and of the College of Medical Sciences in particular. I wish also to acknowledge with much appreciation the presence of Dr. W. Barry Wood of Johns Hopkins University Medical School, Dr. Edward Kass of Harvard University Medical School, Dr. Robert Williams of Western Reserve University Medical School and Dr. Lester Dragstedt of the University of Chicago Medical School, all of whom participated in today's Symposium on Medical Education, which, like tonight's dinner, was presented in honor of Dr. Diehl. This was a most interesting symposium, stimulating to members of our faculty and the student body. We are grateful to those who participated in it and also to Dr. C. P. Barnum, Jr., of our own Department of Physiological Chemistry, and members of his committee who worked with him in the development of this excellent program.

In trying to tell you something about our Dean Emeritus, I find myself confronted with a difficulty in communication. Communication at best is difficult. I was told recently that our armed forces have just about perfected a translation machine which will translate English into Russian, and vice versa. During a recent test, responsible officers in charge of the project decided to feed into the machine an English phrase which was to be translated into Russian and thence back into English. They chose the phrase "The spirit is willing but the flesh is weak." The machine clanked and whirred and various lights flashed. Within a short time the message came back, having been translated and retranslated, as follows: "The wine is fine but the meat is spoiled."

I certainly do not want whatever message I have for you to be garbled in this fashion. The story I want to tell is a simple one. As loyal members of *his* faculty, we of the College of Medical Sciences love, respect, and admire Harold Diehl as a physician, as a leader of medical thought, as a

superb administrator, and as a good friend. I do most fervently wish that I had powers of description equal to the task of painting the sort of picture of him that I should like to be able to do.

Dr. Diehl is a quiet, unassuming man. To my knowledge, he has never been hanged in effigy, nor on the other hand, has he been carried from the field on the shoulders of his players. His name has appeared only infrequently in the public press. The "man in the street" probably knows little of his work.

Yet those of us who have been privileged to work intimately with him—and there are, of course, many in this audience whose association with Dr. Diehl goes back much farther than my own—are sharply aware of his good judgment, his wisdom, his vision, and above all the mighty contribution he has made, directly and indirectly, to medical education and medical research.

I am reminded of the zoologist who finally succeeded in producing an animal which represented a cross between a parrot and a tiger. A friend asked him why he wanted to obtain such an animal, whereupon the zoologist replied "I don't know, but when he talks we sure listen!" This is the way that it has been for the past quarter century in the College of Medical Sciences. When Dr. Diehl talked we all listened—but in this instance, because we knew the things he had to say would be important to us.

Let me give you just a few highlights of Dr. Diehl's illustrious career. Born in Nittany, Pennsylvania, he entered the University of Minnesota Medical School in 1914. He received his M.D. degree in 1918 and, in that same year, joined Base Hospital 26, a University of Minnesota unit which served with distinction during World War I. Following the end of the war, Dr. Diehl served as Director of the North Division of the American Red Cross in Poland, a period of service during which his administrative talents first became obvious.

In 1921, he returned to the University, becoming Director of the University Health Service and also head of the Department of Preventive Medicine and Public Health. He served in these two posts until 1935, at which time he was appointed Dean. In 1937, as you know, he accepted a new position, Senior Vice President for Research in Medical Affairs and Deputy Executive Vice President of the American Cancer Society. He continued in the Deanship, however, on a part-time basis until June 30, 1958, at which time his retirement became effective.

His scientific work on the common cold and upon the control of tuberculosis is well known. He has been awarded many honors, and he has served, with great distinction, not only his college, his university, and his profession, but the American public as well. During and after World War II, he served in top-level national posts with important responsibilities relating to the assignment and utilization of medical manpower. His accomplishments in this important area have been widely recognized.

What might one say of the Deanship itself? I am reminded, in a negative sort of way, of the remark of one Alfredo Zacchini in explanation of his early retirement from the family circus act. "You been shot out of one cannon, you been shot out of 'em all." This is definitely not true of Medical School deanships. The Deanship at the University of Minnesota Medical School is something special indeed—special because it was made so by Harold Diehl. It was during his Deanship that Minnesota rose to take its place among the nation's top medical schools, that its scholarly productivity attained national and international recognition.

A recognized medical educator, Dr. Dana Atchley, once said "Universities should study the epidemiology of ideas." Certainly our University has been such a student, and the College of Medical Sciences, under Dr. Diehl's direction, has been a place where the infectiousness of ideas has been carefully fostered, where the contagiousness of curiosity has led to an epidemic of truth-seeking.

Because of our deep feeling for Dr. Diehl, because of his truly outstanding contributions, we are honored that one of our most important buildings —one with an intimate relationship to the College of Medical Sciences—will bear his name.

President Morrill's later words will mark the formal naming of this building. First, however, let me proceed with the ceremony which will result in preparation for the cornerstone for the new building. In the center of the room is a copper box. I will ask a number of friends and associates of Dr. Diehl to come forward and to place in the box certain items representing highlights of Dr. Diehl's career.

Later, the box will be sealed and placed in the cornerstone of the building. We do not, of course, know under what circumstances this box will be opened hundreds of years hence. We feel confident,

however, that historians of that distant age will recognize in these memorabilia, the accomplishments of Harold S. Diehl as those of a true leader of men.

Will the following individuals please come forward?

Dr. John L. McKelvey
Microfilm of 1918 Graduation Program of Medical School.
Picture of Dr. Diehl in Red Cross uniform.

Dr. O. H. Wangensteen
Microfilm of Dr. Diehl's first publication.
Page proofs of Dr. Diehl's latest publication.

Dr. Ruth Boynton
Bottle of copavin.

Dr. Gaylord W. Anderson
Microfilm of copy of *Healthful Living*.
Picture of Dr. Diehl at World Health Organization meeting.

Dr. Cecil J. Watson
Enumeration of Medical School enrollment and degrees since 1935.
Program for 1958 Recognition Exercises of Medical School.

Mr. Ray Amberg
Reprint of article, "Of Men and Ideas," by Jay Edgerton.

Dr. B. B. Souster (President, Minnesota State Medical Association).
Reports on short courses for physicians given during Dr. Diehl's tenure as Dean.

Dr. M. B. Visscher
An account of the development of the research program under his direction.
A list of department heads brought here by Dr. Diehl.

Dean N. L. Gault, Jr.
Microfilm of University catalogues 1921, 1935, 1958.

Dr. Donald J. Cowling
Picture of Mayo Memorial and program of dedicatory dinner.

Dr. J. Arthur Myers
Reprint of article by Dr. J. A. Myers concerning Dr. Diehl's career with a list of his publications.

Dean H. Mead Cavert
Program for Symposium and tonight's dinner on Medical Education.

Dr. Howard Conn
Picture of Dr. and Mrs. Diehl with their two children.
Picture of Dr. and Mrs. Diehl with their seven grandchildren.

Finally, let me mention two additional points. The first is the contribution made over these many years by Julia Diehl. She has truly been the perfect Dean's wife, working at Harold's side, helping him, and encouraging him. On many occasions, he has spoken of the role she has played, and it is fitting that this role should be acknowledged and emphasized tonight.

Secondly, I want to acknowledge my own very deep gratitude to Dr. Diehl. It was he who gave me the initial opportunity to enter the field of medical education and administration, a field I have found fascinating and stimulating, largely because he made it so. I have had a unique opportunity of working with him during the past several years. I have learned much from him, and I can only hope that I have learned enough to be able to carry on the traditions of this great College which Dr. Diehl has done so much to build.

And now let me introduce the President of our University, Dr. James Lewis Morrill, who will present the dedicatory address.

Dedicatory Address—Diehl Hall

JAMES LEWIS MORRILL, LL.D., L.H.D.
President, University of Minnesota
Minneapolis, Minnesota

IT IS a somewhat unusual and even premature occasion that we share this evening to "dedicate" a building still being built—and, by authority of the Regents, to give it the name that it so well deserves. But a very happy one, indeed.

Without meaning to be sacrilegious, surely—we are kind of "canonizing" Dean Diehl in advance of complete construction—something new in the tradition of this University: designating him a Saint of the Medical Sciences, so to say, in order to perpetuate the respect and reverence of future generations that we who have lived and worked with him so surely feel.

Or if knighthood were still in flower, we would bestow upon him that honor—with the admiring accolade of "Dedication, Dignity and Distinction."

It is not only "dedication" in the sense of the naming of a building that I mean in speaking of "dedication, dignity and distinction" . . .

It is dedication in the meaning of devotion.

For here is a servant of the University and the State who has given nearly 40 years of his life to this institution, 23 of them as Dean of the Medical Sciences.

Here is a person whose dignity has been the by-product of an inner integrity which all of us have discerned and respected.

Here is a career which, step by step, year after year, has won the distinction which it deserves—and which, indeed, has been recognized by that great organization, the American Cancer Society with an opportunity for leadership larger even, he has felt, than that which the University could offer.

The satisfaction and reward of any college or university administrator must be largely vicarious. They come from his awareness of the encouragement and support he can give to his colleagues, the teachers, the scholars and scientists of his staff.

Patiently and persistently he has recruited a distinguished faculty—a faculty inspired to make progress, capable of productive teaching and research.

And so clearly this kind of high competence has made itself felt in the total scholarly enterprise of the University as well.

It has upgraded investigation and discovery.

Its interdisciplinary influence has been catalytic on this campus.

These results have been the dividends of an unremitting devotion and dedication.

But they have required the means to make them possible.

The mobilization of financial resources to support the medical science program of the University—from the State Legislature, the Federal Government, countless generous private benefactors and donors, organizations and associations—has been a self-imposed responsibility of Dr. Diehl in his years on the campus as Dean; a responsibility unremittingly undertaken and pursued.

He has been alert to every possibility in this regard—envisioning many of these himself, lending persuasive encouragement and assistance to the efforts and projects of others.

There is an old Latin saying to the effect that "if you would see a man's monument, look about you." The towering success of Dr. Diehl's endeavors we see in the great Mayo Memorial. We see it in the Variety Club Heart Hospital, the Veterans of Foreign Wars and the Masonic Memorial cancer projects, the many buildings and facilities in the provision for which he has been so influential.

Among this company of Dr. Diehl's colleagues and friends, I am sure he is happy to see members of our Minnesota Legislature whose generous understanding and support have helped so greatly to make possible the realization of his high purposes.

At the heart and center of the University's medical program is the training of doctors, and of doctors who will train more doctors.

In Dr. Diehl's years as Dean, the University has awarded the M.D. degree to 2,570 young men and women—and three out of every five of them have been practitioners in Minnesota.

Of all these 2,570 graduates, practicing in Minnesota or elsewhere, more than half practice "general medicine"—they are "family physicians," that is. No medical school in the Upper Midwest can match this record.

And among all the medical schools of the nation, only Harvard and Johns Hopkins have produced more graduates entering the fields of teaching and research. This, too, Dean Diehl and the citizens of Minnesota can be proud of.

Let us remember the more than 3,000 graduates of the School of Nursing who have gone out from the University during his deanship; the 1,030 medical technologists; the hospital administrators, x-ray technologists, the physical and occupational therapists; the more than 23,000 physicians who have attended the programs of post-graduate medical education on the campus and throughout the state which were developed and expanded under his leadership; the graduates of the School of Public Health whose knowledge and training have spread the name and fame of Minnesota not only nationally but in far-flung countries throughout the world.

I hope that as he looks back upon his life and work at this University, Dr. Diehl will see all these former students, for whom he helped so notably to create opportunity, as a great army on the march into the years beyond his time—advancing to new frontiers in the discovery of new knowledge, ministering to untold numbers who need help and rescue from the dangers of death and disease.

There's a peculiar paradox about this building that will bear his name that is a bit amusing. Dean Diehl, as his close friends and associates know, has a very slight sense of smell. He can sniff trouble, or money for Medicine, a mile away—but he is impervious to other odors.

I remember, as a high school boy years ago, attending a vaudeville show in which two comedians were trying to out-boast each other. One of them boasted he had an uncle who owned 2,000 cattle on a ranch in Texas. The other said his uncle had a ranch in South America on which 5,000 goats were grazed.

"But there's a funny thing about those goats," he said. "They haven't got any noses."

"Well, then, how do they smell?" his partner inquired.

"They smell awful bad," the other chap said.

You see, Dean Diehl would have made a poor comedian. He just has no olfactory sense of humor.

Now the paradox about the building that I mentioned is an olfactory one. Because it will house hundreds of animals indispensable for research, it will have a huge smoke-stack to carry off their odors. Just "wasted money," I'm sure the good Doctor regards it.

But these experimental laboratories will provide a long and seriously needed facility for medical research—and the other phase of the building will house the bio-medical library for which he has struggled so many years.

This splendid structure, indeed, will exemplify much that I have been saying about Dr. Diehl's aims and attainments. For here teaching and research are to be given new strength. And here is witnessed, in the financing of the structure, the contagion of his capacity to mobilize support.

Responding to his appeal, the Legislature appropriated $832,000; the U. S. Public Health Service provided almost a matching amount. Gifts exceeding three-quarters of a million dollars came from individuals and corporations and foundations, with the help of the Dean's faithful friend, Dr. Donald J. Cowling, and colleagues of the Faculty. Notably among additional resources toward cost of the library was $108,000 from the University's "Copavin" trust fund, representing patent right royalties accumulating to the University over the years from the Dean's own research on a product for treatment of the common cold.

Ladies and gentlemen, it is with profound respect, and with most grateful and affectionate regard, that we recognize the productive impact of a dedicated personality upon this institution. How fitting to write in perpetuity on this campus the name of Harold S. Diehl.

It is my privilege now to unveil the plaque of enduring University remembrance in the years to come—and I shall ask the Dean to stand with me as I perform this official act on behalf of the Regents and faculties of the University.

Diehl Hall—A Symbol

HAROLD S. DIEHL, M.D.
New York, New York

Dr. Diehl, Dean Emeritus, College of Medical Sciences, University of Minnesota, is at present Senior Vice President for Research and Medical Affairs and Vice President of The American Cancer Society, with headquarters in New York City.

WHEN I received the invitation to participate in this evening's program, I wondered what I should say in the few precious minutes available to me. Many things came to mind; but first and foremost, I decided that I want to say *many, many "Thank you's"* both for Julia and for me.

I want to say "thank you" President and Mrs. Morrill, or better still, "Freda" and "Lewis," for your constant encouragement, for your unfailing support and, above all, for your wonderful friendship—a prized possession which we hope to keep always.

I want to say "thank you" to the Regents for giving us this memorable evening, for your friendly support in my years as Dean and for authorizing the naming of the new building in my honor. I want to thank the representatives of the State of Minnesota. I want to thank "Bill" Middlebrook, Malcolm Willey, Dean Blegen and many others in the central University administration and on the general University faculty. And, I want especially to thank my colleagues and friends on the faculty of the College of Medical Sciences. To have been associated with you over all these years

has been one of the greatest privileges that anyone could possibly have had. To Julia and me you have been a wonderful family and as such we will always remember you. I want also to thank our many friends for coming here this evening. And finally, I want to thank those who arranged this occasion for inviting our relatives and a few close friends from outside the University group, and especially for inviting our children. Their being here completes the family circle and makes this a perfect evening.

Before proceeding further, I want to admit to a bit of a shock in seeing my name listed on the program as "Dean Emeritus." In time, I presume, I will get used to this but I still feel much like Dr. Evarts Graham must have felt after his retirement a few years ago as Professor of Surgery at Washington University. Concerning this, Dr. Graham said that a few days after his retirement, when Mrs. Graham went to the grocery store, her grocery-man said: "I was sorry to read in the paper the other day about Dr. Graham. What is this condition 'emeritis' that he has? Is it serious, or is it something he will get over?" Mrs. Graham, being quick-witted, responded: "Oh, it is a condition that comes on as a professor gets older. It is something that he just has to learn to live with." In my case, I am sure that I will learn to live with it, but at the moment, it still seems a bit strange.

When my predecessor, Dean E. P. Lyon, retired, he gave me an address entitled: "Swans Sing Before They Die." He took this title from a verse which reads:

> Swans sing before they die,
> 'Twere no bad thing
> Did certain persons die
> Before they sing.

As for me, I am not yet ready to sing my "Swan Song." True, Julia and I have moved from the banks of the Mississippi to the banks of the Hudson. But we are very much alive and are facing the future with interest and enthusiasm and with the hope that in the years ahead we may be able to make a contribution to the vitally important work of the American Cancer Society. This evening, however, I am sure that you will forgive me if I look backward a bit as well as forward.

The copper box to go into the cornerstone which you have filled this evening tempts one to speculate as to what Medicine, the University, the State of Minnesota, the United States, the world and even the universe will be like 600 years from now, when, as I understand it, this box will have to be opened if the contents are to be examined before they disintegrate.

To try to guess what will happen in the fields of medicine and public health in the next 600, 100 or even 25 years, would require more proficiency as a crystal gazer than I possess.

1958 was Minnesota's Centennial year. A hundred years is but a brief moment in the history of the world or even of mankind but more progress was made in the prevention and cure of disease during the last century than in the millions of years which went before.

Will the next 100 years bring an equal amount of progress? Certainly there is every reason to think so; for the rate of scientific advance has never been greater than it is today. So, when our copper box is opened, will cancer, arteriosclerosis, high blood pressure, mental illnesses and possibly even the common cold be only names and of interest historically as the Black Death and the other great epidemics of 600 years ago are of interest to us today? It would certainly be interesting to know.

As for me, however, I am content to live in the present and am thrilled to have the building housing the medical-biological library and the associated medical research laboratories named in my honor.

In a way I feel relieved that you have done this, because otherwise I would be retiring after 38 years on this faculty with my name having been attached to only two things associated with the University. One was the enormous excavation for the Mayo Memorial which, during the year or more that construction ceased because of rising costs, came to be known as "The Dean's Hole" or "The Dean's Folly." Later, when a water-main broke and this hole was partially filled with water, it was called "Diehl Lake."

The other thing with which my name is associated is a recipe which appears under the caption "Harold Diehl's Punch" in the recently published *Curriculum for Cooks,* prepared by the University Hospitals Auxiliary and the Faculty Women's Club of the University. Now this is a good punch, and I am glad to have my name associated with it. I am pleased, however, that these are *not* the only continuing associations of my name with the University of Minnesota.

Seriously, though, you could not possibly have

paid me a greater or more deeply appreciated honor than to associate my name with this building of which I dreamed so long, for which I worked so hard, and which, in the years ahead, will be a symbol as well as the heart of scholarship and of scientific progress in this great medical center. For recommending that this building be named for me, I thank the Administrative Committee of the College of Medical Sciences and the Administration of the University, and for authorizing it, I humbly thank the Board of Regents.

I also thank the Legislature for appropriating the money for the construction of the Library, and I thank the individuals, the groups and the United States Government which provided the funds for the research laboratories. I am particularly pleased also that construction of this building was assured before I retired. As I said last June, I could not possibly have had a finer retirement present than the news that the bids for this building were within the funds available.

I want to thank President Morrill and the Regents also for inviting the members of the Minnesota Legislature to be with us here this evening. For more than 20 years, I have appeared before appropriation committees of the House and the Senate to ask for funds to support the medical school, for medical research and for the University Hospitals. On these occasions, you were always courteous, interested, and generous. As a result, we have been able to develop at the University of Minnesota a great center of medical teaching, medical research and medical service—a center which not only is making distinguished contributions to medical progress but also is bringing distinction to the University and the State of Minnesota. I am sure that you agree with me that the funds which you have provided over the years for this enterprise have been a good investment.

And now may we take a brief look ahead. First of all, let me assure you that I have no doubts or misgivings about the future of our College of Medical Sciences. You have in the Medical School, the University Hospitals, the School of Nursing and the School of Public Health strong and dedicated staffs with the ability, enthusiasm and imagination to continue to move forward. Facilities are adequate, except for the completion of the remodeling of Jackson Hall and Millard Hall. In Jackson Hall, we need to provide teaching laboratories in anatomy and pathology for the larger medical classes which have been authorized. Millard Hall has some areas which are unchanged from the time of their construction more than 40 years ago. These need to be modernized. I hope that the Legislature will provide the funds this year for these important unmet needs.

I do not want to emphasize needs this evening but I would not be honest with you if I did not say that I am disappointed that we did not succeed before my retirement in obtaining funds for the construction of the proposed residence hall for married interns and medical fellows. These are carefully selected young men and young women upon whom future leadership in medicine and medical research depends. They come here to continue advanced studies and to engage in research. Their fellowship stipends are small, yet practically all of them are married and have children. This combination of circumstances plus the shortage of housing near the campus compels most of them to live many miles away from the University hospital and from the research laboratories in which they work; and even so, they frequently have to live under conditions that are disturbing and unfair both to them and to their families. The result is that they are tremendously handicapped in their scientific development and their research activities. Some give up in frustration. To correct this, we have proposed the construction of a moderately-priced housing development for this group within walking distance of the Medical School. I hope that this can be made a reality in the near future. It would, I am sure, pay big dividends in research accomplishments and in the development of our medical leaders for the future.

And now to get back on the track of my remarks about the future. I have spoken of our strong staff and our splendid facilities. In addition to these assets, I would mention especially two more. One is the invaluable interest, faith and support of the Medical School by the people of Minnesota. The other is the able and imaginative young man whom you have chosen as my successor. Dr. Howard was recommended for this appointment by President Morrill, with the unanimous endorsement of the advisory faculty committee. I am certain that no one will ever have reason to question the wisdom of this choice. The future holds great possibilities but it is certain also to present many problems. Dr. Howard, I am sure, will see and take advantage of the opportunities and will deal effectively and constructively with the problems.

Speaking of problems, one which you have already faced and taken steps to meet is the need for training more physicians. Your decision to increase to 150 the number of students admitted annually to the Medical School is clearly justified and forwardlooking.

Whether facilities for the training of still more physicians should be provided by or within the State of Minnesota is a question that is doubtless in your minds. In fact, I understand that it is being raised in the form of a proposal for a new medical school in St. Paul. Over-all in the United States, there is a need for the education of more physicians to keep pace with our increasing population. It does not necessarily follow, however, that this holds true for Minnesota. I would urge therefore that the need for educating more physicians within the state of Minnesota and the possible resources for such training be carefully appraised on a statewide basis by some appropriate body or group. If such a study indicates a real need for the training of more physicians, the question should then be raised whether such training can be best provided by further expansion of the University's Medical School, by the extension of the excellent graduate medical programs of the Mayo Foundation to include undergraduate medical education, or by the establishment of a new medical school. The development and support of a new medical school are tremendous responsibilities and should be undertaken only after most careful and serious study.

As a conclusion to remarks on an occasion such as this, I presume that one should give some advice or exhortation for the future. The only advice that I have to give, however, is keep your sights high; have confidence in yourselves, your University and your State; do not compromise with quality in education, in research or in service to your patients; continue to cultivate the interest and support of the people of Minnesota, physicians and laymen alike, in the work that you are doing, and continue to function as a team within your own college and within the University. Warren Weaver of the Rockefeller Foundation wrote in a recent issue of *Science* (July 18, 1958, p. 128) that "an institution is too big when the whole is no longer more than the mere sum of its parts." Here at the University, I have always felt that among our greatest assets and our most unique characteristics have been the easy exchange of ideas and the co-operation and team work that has existed between individuals, between departments and between colleges. Guard this with care so that it is not lost in the complexities of a large organization.

And finally, Julia and I want you to know that our many years with you have been happy and rewarding ones, that we will never forget you and that we hope you will not forget us.

HEARING AID INDUSTRY CONFERENCE TRANSCRIPT AVAILABLE

A transcript of the first joint conference among the professions and commercial elements serving the hard-of-hearing is now available, the Hearing Aid Industry Conference, sponsor of the conference, has announced.

The conference was held in New York City on February 17, 1959. Its purpose was to exchange information on the most recent advances in service to the hard-of-hearing in surgery, medicine, rehabilitation and technology. The sponsor suggests that the transcript may be of interest to all persons in these fields, especially since participants indicated the session had helped bring greater understanding among the various fields represented.

Represented were the American Academy of Ophthalmology and Otolaryngology, the American Hearing Society, the New York League for the Hard of Hearing, the Bureau of Medical Rehabilitation of the New York State Department of Health, the Society of Hearing Aid Audiologists and the HAIC.

Requests for transcripts should be made to Hearing Aid Industry Conference, 2900 W. 36th Street, Chicago, Illinois. Since the supply is limited, requests will be honored on the basis of date of receipt, one transcript per request.

Editorials

JOHN F. BRIGGS, M.D.
ARTHUR H. WELLS, M.D.
HENRY G. MOEHRING, M.D.

60-30-10

These several circumstances have combined to stimulate the application of the 60-30-10 Law to current educational decisions:

1. The tale of a child's sullen behavior provoking from the mother the comment, "Isn't it terrible, the sort of kids they're raising in schools nowadays?"
2. Recurrent discussions about the need for more, bigger, and flossier school buildings.
3. The statement of the 60-30-10 Law by Dr. Milton Friedman *et al.**

That the principle of the 60-30-10 Law is applicable to our schools and education is self-evident. For the moment, and for the sake of illustration, accept the value judgments; i.e., 60 per cent of the effectiveness of schooling depends on the students put into the educational system; 30 per cent depends on the quality of the teaching; and 10 per cent depends on the physical plant in which the teaching is done. Then it follows that school boards who are bending all their efforts toward raising funds for more, bigger, more plush school buildings should start directing this energy toward employing better and better, and more inspiring, teachers (and weeding out some of the duds currently secure under the protective umbrella of tenure-is-supreme, professional-ability-be-hanged). Further, that parents who are harrying school boards to remedy the ten thousand ways in which our schools are failing, should themselves do something about injecting higher quality raw material into our educational system.

Marriage is the only socially sanctioned framework within which human reproduction can occur, and the choice of marriage partners (and therefore human breeding) remains a fairly random proposition. So eugenic techniques for improving the raw material fed into the schools are stymied. This leaves, however, abundant scope for even randomly self-chosen parents; to wit:—the inculcation in children of a desire for making the most of their abilities (what better goal for education?); the inspiration of children to eschew the life of ignoble ease and to occupy their energies with broadening and useful pursuits; the implantation in children of the awareness that a busy life is not only more likely to be productive but also to be happier, that even if work may not be praiseworthy *per se*, it is a laudable means to virtuous ends; the instillation in children of a wholesome sense of responsibility.

All these sound formidable? Don't sell the children short. Try these principles on them. Their cooperative acceptance and discharge of such responsibilities runs a higher titer per year of age than any of us can again reach.

H.G.M.

ADDENDUM: Two seriously critical students from a *new* high school reviewed the proof copy of this editorial and advocated changing the 60-30-10 values to 50-40-10, or even 45-45-10. Note the agreement with the "10" figure.

*"*The 60-30-10 Law.* The principle of this law is not new, but we have assigned to it value judgments. The 60-30-10 law is as follows: The values of the factors which influence irradiation cures are 60 per cent for the nature and extent of the tumor, 30 per cent for the skill and experience of the therapist, and 10 per cent for the modality employed . . . ." Am. J. Roentgenol., 81:415, March, 1959.

ESSENTIALS OF MONONUCLEOSIS

The following observations on mononucleosis have been gleaned from observing the impact of this disease on the student body at a state university. One of the most incomprehensible features of mononucleosis is the fact that a student ill with pharyngitis and fever apparently cannot transmit the disease even on intimate oral contact. Thus, "a history of exposure" so helpful in other instances is singularly lacking in mononucleosis. Transmission appears to be by way of an asymptomatic carrier, with no clinical or laboratory evidence of the disease. In this population the incidence among married students is so disproportionately low as to lend strong circumstantial support to the view that transmission is usually the result of a type of kissing favored by newly intimate or engaged couples.

Patients with this disease commonly complain of sore throat, malaise, and fatigue. Cases without

pharyngitis are classified as atypical, (typhoidal). Some students complain of a rather severe generalized headache lasting several hours daily during the prodromal period. Complaints of cough and myalgia are so uncommon as to point to some of the commoner influenza-like diseases. Few cases will be overlooked when honest attention is focused on the following signs:

Fever—Present in all, usual duration about nine days.

Adenopathy—This is the sign on which presumptive diagnosis hinges and can be found in almost all cases. When the examiner stands on the right side of the seated patient, careful palpation, with the tips of the fingers of the left hand from the back of the neck, will demonstrate enlarged left posterior cervical nodes in 99 per cent of cases by the end of the first week of illness. Right posterior cervical adenopathy, while an erratic runner-up, is of second importance. Axillary, epitrochlear and inguinal adenopathy can sometimes be elicited but their importance has been overstressed. Significant anterior cervical adenopathy suggests concurrent Vincent's infection or streptococcic pharyngitis.

Pharyngitis—Present in 90 per cent, may develop late. Palatine petechiae or a white tonsillar exudate appear in about one fourth of cases.

Splenomegaly—Present in 70 per cent male and in 30 per cent female patients.

Hepatomegaly—Present in 30 per cent, jaundice in 5 per cent.

Rash—So rare in patients untreated with antibacterial agents as to suggest some other diagnosis.

Most patients have a definite leukocytosis. Blood smears as prepared in the average laboratory for routine differential counts are too heavy to permit accurate identification of atypical lymphocytes; smears should be about one-half the usual thickness. Atypical lymphocytes in percentages ranging from 20 to 67 are present during the midfebrile period of the illness and are sustained at this level for a week or two. Smears made after the temperatures have returned to normal often do not demonstrate these cells clearly. Neutrophil counts are usually lowest a few days after normal temperatures appear and range from 6 to 49 per cent. All patients with a diagnostic smear, pharyngitis and cervical adenopathy will develop a heterophil titer of at least 1:56. This statement is based on over 700 cases, in which it was possible to check this test through the seventeenth day of illness. Thus, the patient with mononucleosis will have not one or the other, but both hematologic and serologic evidence of the disease. Absorption tests are unessential in patients with classic clinical and hematologic signs of mononucleosis. In my opinion, the practice of reporting diseases with gross hematologic or serologic deficiencies as mononucleosis is contrary to available evidence, serves no useful purpose and is responsible for most of the confusion about this disease.

It should be remembered that (1) positive heterophil tests on unabsorbed serum are present in other conditions, (2) tests may remain positive as long as one year after the illness, or (3) once negative may be reestablished during some subsequent illness. Consideration of these points illustrates the fallacy of basing the diagnosis on the positive heterophil test alone. Atypical lymphocytes will be absent in these situations, while the patient with acute mononucleosis will have both a positive heterophil test and a high atypical lymphocyte count.

At the university health center, mononucleosis is not a protean disease studded with the galaxies of bizarre clinical syndromes commonly described in the literature, but a disease with a remarkably clear, stereotyped picture. It is significant that accounts of mononucleosis with the most atypical features frequently lack common clinical or laboratory findings, sometimes both. For the present, it would seem appropriate to reserve the term mononucleosis for cases having both hematologic and serologic findings to support this diagnosis.

CHARLES E. BENDER, M.D.
University of Washington

THE TRANQUILIZERS

The ability to classify, to *name* things, is man's basic means of communication. However—as indispensable and as comforting as they are—names have no magic in themselves. Naming does not necessarily imply complete understanding; for example, when we describe an illness as "functional," we are not only communicating knowledge, but also revealing ignorance.

So it is with mental illness. The names that psychiatrists have given to the many forms of mental illness have undoubtedly been helpful to understanding. It would be a mistake, though, to expect them to have precise limitations which, because of the nature of mental illness, they cannot have. Diagnostic labels are of little help when we try to pinpoint specific indications for tranquilizing drugs.

Tranquilizers act to allay the tension and anxiety that may accompany many different mental conditions. Patients who demonstrate hyperactivity (which may range from extreme restlessness to destructive violence) are those for whom the drugs are most often given and who usually respond the most dramatically to them. However, investigators have also reported success in using tranquilizers to treat depressed and apathetic patients. At first glance, this result seems paradoxical. After all, one might think that depressed patients would require a psychic change opposite to that produced by a tranquilizer. In general, this may be true and, when given to depressed patients, some tranquilizers have only deepened the depression. However, when anxiety is the underlying cause of depression, it does not seem paradoxical for a tranquilizer which effectively lessens anxiety to lessen the depression caused by anxiety. Hopefully, as our knowledge of what causes mental and emotional stress increases we will be better able to pinpoint the action of tranquilizers and to design drugs which will specifically treat certain psychoses and neuroses. As of now, we can say that almost all hyperactive patients (including agitated depressed patients) are likely to respond well to an effective tranquilizer, and that by relieving the anxiety accompanying depression, some tranquilizers may be of help in treating many depressed, apathetic and withdrawn patients.

Our knowledge of mental illness is limited. Our knowledge of the usefulness of tranquilizers is chiefly empirical. Trying to describe exactly how the tranquilizers act is a little like it would be trying to describe how penicillin acts if Fleming's discovery had occurred before Pasteur's.

Animal Experiments

Male Siamese fighting fish are, to say the least, unsocial. When two are placed together in a bowl of water they will usually fight until one or the other is dead. However, when a tranquilizer is added to the water, mortal enemies often find peaceful coexistence possible. Observing a drug's ability, if any, to modify the fighting instinct of these fish provides researchers with a rough preliminary test for screening drugs which may have tranquilizing activity.

An important part of the animal research done by pharmaceutical houses is designed to screen compounds in an attempt to find useful new psychotherapeutic agents. One ingenious and valuable screening test used in the Smith, Kline & French Laboratories is based on Pavlov's technique for bringing about a conditioned response. Rats are trained to leap on a pole when given a slight electric shock at the same time a buzzer is sounded. Eventually, they leap at the sound of the buzzer alone; for they learn to associate buzzer with shock, both with trouble. After receiving a barbiturate or other sedative, the conditioned rats no longer respond to either the buzzer or the slight shock. After receiving an effective tranquilizer, the rats no longer respond to the buzzer, but *do* respond to the shock. This ability to block the *conditioned* response without affecting the normal reflex, distinguishes most compounds which exert a true tranquilizing action.

Screening tests are only the beginning of a long series of animal experiments which may take years, and then not lead to anything. However, if research on animals proves that a compound is safe and probably effective, clinical research begins. Most clinical research on a new tranquilizer tries to determine the drug's general efficacy in treating various types of mental illness. As the drug becomes more accepted, clinical research usually becomes more sophisticated. For example, one continuing controlled study of chlorpromazine is being conducted on released mental patients whose progress has been, and will be, followed for many years. Hopefully, the study will reveal the need for, and efficacy of, long term therapy.

There are many other interesting areas of current research: Research to "test tests"—that is, to evaluate standard psychological tests and to develop new ones—may provide objective, precise methods for judging the effect of tranquilizing drugs; animal research to determine behavioral responses to certain stimuli may shed some light on the possible causes of neuroses and psychoses. There are others. But, of course, it's impossible for this editorial to take more than a brief look at a small portion of what is really a vast amount of research. Research whose ultimate goal is victory over mental illness.

MAURICE R. NANCE, M.D.

President's Letter

HOSPITAL ACCREDITATION

Since the Joint Commission on Accreditation of Hospitals was set in motion some seven years ago, you have heard many pros and cons. You have read many articles written by doctors and administrators vehemently protesting the so-called "policy system" of the Commission. Others have been complimentary in their comments.

It has been stated that "inertia and a reluctance to improve are responsible for the fact that almost 50 per cent of the hospitals in the United States are still not accredited." Nevertheless, hospital accreditation is here to stay and there is a growing interest, stimulated by many lay magazines, in accreditation on the part of the public.

There seems to be an inherent resistance on the part of many hospitals and doctors to achieve the status of accreditation. This status is actually not as exalted as might appear, inasmuch as accreditation only required hospitals to meet a minimum standard of quality. It is a voluntary program and actually in existence for forty years beginning with the late Dr. Malcolm T. MacEachern. At present, its purpose is to create in all hospitals an environment that will insure the best possible care of the patient.

In the foreword on Standards by Kenneth B. Babcock, M.D., Director, he states,

"These standards are considered necessary to insure the quality of medical care in hospitals which the Joint Commission can faithfully recommend to the public. They are not arbitrary or rigid in spirit, yet they require general conformity to achieve accreditation by the Commission. To qualify for accreditation, the hospital must have at least twenty-five beds, have been in operation at least twelve months, and, if located in the United States, be listed in the administration's guide issue of *Hospitals,* published by the American Hospital Association. There are basic principles and methods of procedure, dependent upon the type, size, degree of departmentalization and resources of a particular hospital."

In Massachusetts, a law governing hospital licensing (signed by the then Governor Christian A. Herter in 1956) was amended to clarify the state health department's status in examining medical records of unaccredited hospitals. Under the amendment the health department may order an examination of the medical records and "staff qualifications of all proprietary hospitals, sanatoria and all voluntary hospitals not fully accredited by the Joint Commission and may order such an examination of the medical records of other hospitals as said department may deem necessary." The law states also that hospitals must pay for such examinations.

Certainly, we have too many laws now that aggravate us but there may be more to come. I think it behooves us all as physicians to get on the band wagon and keep our house in order. I have served on records and audit committees and sometimes it has been a thankless job. Nevertheless, surveys are beginning to show that these committees and the tissue committees are producing amazing results in raising hospital standards. There is an old adage that "if you can't beat them you had better join them." However, if we work hard and diligently enough, we can join something we like rather than have to join something by compulsion that we will never enjoy.

Benjamin B. Forster M.D.

President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

HOSPITAL ADMISSIONS STUDY ANNOUNCED

A $200,000 study has been authorized by the Executive Committee of the Health Information Foundation to determine why more than 20,000,000 Americans or one out of eight enter a hospital each year. The study will be conducted jointly by the National Opinion Research Center of the University of Chicago and the Health Information Foundation.

A sample of admissions to hospitals in Massachusetts will be examined through the approval and cooperaiton of the Massachusetts Medical Society, the Massachusetts Hospital Association and the Blue Cross-Blue Shield Plans in that state. The 2½-year study will attempt to ascertain the non-medical factors and family situations which lead to hospital utilization as well as medical reasons given by physicians.

According to George Bugbee, Foundation President, admissions to hospitals are governed not only by medical diagnosis but by concepts of patient comfort, optimum conditions for treatment and by many personal and social factors.

"These same factors may also affect the patient's length of stay in the hospital," he said, "and it is important to study them if we are to establish a reasonable definition of the role of the hospital."

Such a definition is essential, he explained, because it governs interpretations of use or possible "overuse" of health insurance benefits.

"There have been allegations in recent years that there is 'abuse' or 'overuse' of hospitalization insurance," he said, "and that such 'overuse' adds substantially to the cost of care. We hope that the new study will bring greater insight to concepts of what constitutes adequate use of our hospitals."

Mr. Bugbee said the survey is one of a group of major studies of voluntary health insurance sponsored by the Foundation. The foundation was organized in 1950 as a contribution by the drug, pharmaceutical, chemical, and allied industries to research and education in the social and economic aspects of medical care.

According to the Foundation, many non-medical considerations are increasingly important influences on admissions to hospitals, and consequently, on the cost of care.

"The degree to which individual judgment is involved is one of the objectives of our study," said George Bugbee. Among others he included the individual's attitude toward hospitalization, his home and job situations, his ability to meet costs, and his doctor's habits, beliefs and experiences.

"We need to know much more about what the public expects of hospital service," Mr. Bugbee said. "Our study, however, will not attempt to evaluate current use of such service, but rather will describe it and thus be of value to those concerned with defining what may be considered justifiable and legitimate use of hospital care."

"Before limitations are imposed on money being spent for hospital care or the number of people being admitted to hospitals it is important that we have full information on why hospitals are now being used so much more widely," he said. "That is the purpose of our study."

"Overuse of services would be wasteful," Mr. Bugbee said. "On the other hand, undue limitations could stand in the way of needed medical care or could delay progress."

HOSPITAL HEAD TELLS HOW MEDICAL ADVANCES AFFECT HOSPITALS

The superintendent of the University of Chicago Clinics, Mr. Ray E. Brown, recently pointed out that medical advances not only influence the community's total hospital bill, but also affect the community's utilization of hospitals.

"In the first place," according to Mr. Brown, "these medical advances now permit doctors to offer treatment to patients whose condition was classified as hopeless and incurable a few years ago. These patients represented no expense to the prepayment plans because there was no treatment for them.

"If one reviews the average hospital's census today it is likely that a goodly per cent of the patients will be undergoing therapy that was unknown just a few years ago. Much of this new therapy is difficult and of long duration.

"The effort on behalf of these patients consumes an increased number of more costly hospital days that represent a net addition to the pay-out total of the community's prepayment plan," he said.

Mr. Brown pointed out that it is difficult to answer the question of whether some patients with prepayment overuse the hospital.

"The essential question in this connection is not concerned with whether those with prepayment coverage used more hospital care. If prepayment is serving any social purpose at all it would be expected that its members would have had better financial access to hospital care."

Medical items not covered by prepayment, such as prescription sales, have increased tremendously during the past ten years, and thus offer some evidence that the public is interested in health care "for its own sake and not as a means of beating the prepayment game," according to Mr. Brown.

In an article published in *Hospitals,* Journal of the American Hospital Association, Mr. Brown noted that there are the cultural and economic, as well as medical forces, which affect how many people are admitted to hospitals but are beyond the hospitals' control. Changing characteristics of the American population described by Mr. Brown in *Hospitals* include the following:

—experts say that by 1975 there will be an additional eight million people over sixty-five—a group with higher-than-average medical care needs whose hospital costs are estimated to be from three to four times greater than for those under age sixty-five;

—the dependent child population, those under eighteen, is expected to increase some twenty million or about 35 per cent by 1975. This means that the number of dependents covered under prepayment family certificates (for hospitalization and other services) will increase faster than the total number of certificates;

—concepts of illness are changing; an increase in the number of working wives, for example, means less care for the sick at home and more use of hospitals even for the less serious illnesses;

—the public is becoming increasingly aware of the value of hospital care and such care is "becoming an accepted component in the average American's standard of living."

FOR SALE—ONE UNION CLINIC

The *New York Times* recently reported that a union health center in which two locals of the Amalgamated Meat Cutters and Butcher Workmen's Union invested $240,000 has been offered for sale or sub-lease. Arnold Cohen, Administrator of the Labor Health Institute said that the center had been used for four years by Locals 342 and 640. According to Mr. Cohen, members of the locals would receive better care under group health plans.

HEALTH INSURANCE COVERAGE IN MINNESOTA REACHES NEW HIGH

Benefit payments by insurance companies to the people of Minnesota who are covered by health insurance policies reached a new high during 1958, reports the Health Insurance Institute.

In the period from January 1 through December 31, 1958, an estimated $53.7 million was paid out to help cover the cost of hospital and doctor bills, and to replace income lost through sickness or disability. This represents a 6.2 per cent gain over the 1957 figure of $50.5 million, and is based upon reports from insurance companies doing business in the state.

The rise in benefit payments in Minnesota was reflected in the figures for the nation as a whole, the Institute noted. Persons protected against the expenses of hospital and medical care and treatment received a total of more than $2.6 billion in benefits from their insurance company policies in 1958, up 8.3 per cent over the previous year's high of $2.4 billion.

By the end of the year, an estimated 70 million persons were covered by health cost policies bought from insurance companies, more than all other types of voluntary health plans combined.

GREATER DOCTOR-HOSPITAL-INSURER COOPERATION URGED

Dr. Anthony J. J. Rourke, internationally known hospital planner and consultant, addressing 300 insurance company executives at the Annual Meeting of the Health Insurance Association of America in Philadelphia, May 5, urged better liaison and increased cooperation between doctors, hospitals and health insurers to curb spiraling medical care costs.

Said Dr. Rourke:

"As soon as your industry and our profession can sit down and properly evaluate and measure the portion of increased costs which are due to the substitution of adequate care in place of inadequate care and that portion which may be considered abuse, we will have taken a long step toward a better understanding."

He said that medicine, through its "open skies" plan and accreditation program, had taken "the first long step" toward creating the climate for better understanding. "I know of no other group that bares its inner secrets to the eyes of other professionals in competitive positions in a way similar to that exercised in the accredited hospitals in the United States and Canada," he asserted.

Dr. Rourke, who has worked with hospitals in Alaska and Central America as well as in this country, said medicine had established "four committees of major consequence" which considered such problems as unnecessary hospital admission, increased length of hospital stay, unnecessary procedures and "the absence of stop-orders on expensive and dangerous drugs."

"Organized medicine knows that as prepayment is available, as hospital beds are sufficient and as

an adequate number of physicians have been trained, some increased utilization will occur," he said.

"It behooves the profession of medicine to make sure that this increased utilization represents only needed medical and hospital care and does not reach the point which can be considered over-utilization.

"The field is now fomented with arguments charging abuse, exploitation, unwise methodology and coverage, laxness in administration, and a host of other evils," he added.

He strongly urged larger medical societies to employ health insurance experts on their staffs and health insurance companies to appoint to their staffs more physicians with special knowledge of the fields of prepayment and industrial medicine.

"Liaison between doctors, hospitals and prepayment programs is badly needed," he said.

Dr. Rourke, who spoke on the subject, "Hospital Accreditation—The Significance to Health Insurance," also called for a "summit" session of the health insurance service benefit groups and the indemnity benefit groups.

He said a "cold war" existed between these groups, adding:

"The public, through its elected officials, has been screeching for investigations of the health professions. I can assure you that when it is aware of all the implications it will be screeching for a significant 'summit' session in which to unshackle prepayment into a free world.

"As long as competition prevents the payment of increased premiums adequate to furnish the care the public wants, we will continue to mistake the effect for the cause.

"Competitive surgeons meet and argue and the patient benefits. Competitive carriers (service and indemnity) must meet and argue as truly 'pro bono publico' groups.

"As long as we have no accreditation standards for the purveyors of coverage the public will suffer. Now is the time for your groups to take a page from the physicians' accreditation notebook and act."

MEDICAL AND VOLUNTARY HEALTH INSURANCE PLANS FOR SENIOR CITIZENS ACCELERATED

Dr. Leonard W. Larson, Chairman of the American Medical Association's Board of Trustees said recently that medicine and voluntary health insurance are protecting the nation's senior citizens at a "rapid, accelerated pace." However, he warned that "we have only about one year left . . . a year in which we must work fast and vigorously" to provide coverage for additional millions of the aged or be confronted with tax-paid health care.

He noted that the nation must be concerned "not about the specific provisions of the Forand Bill—which can be amended all over the lot—but about the basic principle involved."

The bill, introduced in Congress by Rep. Aime Forand (D., R. I.), would provide hospital benefits and certain other services to persons receiving Social Security retirement and survivorship payments.

Addressing the Health Insurance Association of America at its annual meeting in the Bellevue-Stratford Hotel, Philadelphia, Dr. Larson said the principle of adding service benefits to the Social Security program, which so far has been limited to cash payments on the "floor-of-protection" concept, "would completely alter the nature of the program."

"It would open the door for evolution of a system of tax-paid health care for the entire population," he declared. "Every two years—in the even years of Federal elections—the familiar process of amendment and expansion would roll faster and farther. Such legislation first would undermine and eventually would destroy our system of voluntary health insurance and the private practice of medicine."

Dr. Larson took note of the rapid growth in health insurance coverage for senior citizens over the past few years and the "hopeful developments" of the last twelve months which have accelerated the pace even more. He cited the joint meeting of last October of representatives of the AMA, health insurance companies, Blue Cross and Blue Shield which resulted in various actions by each of these groups to extend health care cost protection to the over age-65 population.

But because health insurance coverage for older people is "the most urgent, critical field of activity" for Congress in the 1960 election year, Dr. Larson said, medicine and insurance must "work together more closely than ever before" to provide protection for aged. He added:

"I honestly believe that if medicine and insurance will co-operate in a dramatic, convincing drive to increase the coverage of people over 65, we can take the steam out of those who advocate any Forand-type program. This will require open, clean, keen competition between voluntary insurers of all kinds—Blue Cross, Blue Shield, private insurance companies and other sound agencies in the prepayment field—plus the wholehearted support of the medical profession."

Dr. Larson declared that the future of private medicine in the United States "no longer depends primarily upon scientific progress and the professional competence of physicians," adding:

"In these times of swirling social, economic and political pressures, private medicine may stand or fall in relation to the success or failure of voluntary health insurance. . . ."

RECENT MEDICAL LEGISLATION TRENDS REVIEWED

A number of legislative measures, vital to medicine, have recently been introduced or will be introduced in the near future by the 86th Congress.

An analysis of several of these measures is given below for your information:

U. S. Doctor Shortage Study Urged

A bill to provide for the establishment of a commission to study the shortage of doctors of medicine in the United States, was introduced in the House Interstate and Foreign Commerce Committee, April 15, 1959.

This bill would authorize a one year study of the shortage of doctors in the United States. The study is to be undertaken by a twelve member group to be known as the "Commission on the Doctor Shortage in the United States." Its members would consist of two Senators, two members of the House of Representatives, two representatives from the Executive Branch of the Government and six members from private life. The medical profession would have representatives in the last group. The Commission would give particular attention to: The policy of medical schools in limiting the number of student admissions; the number of physicians graduated annually from medical schools in the United States; the extent to which hospitals must seek foreign doctors to fill internships; the number of U. S. citizens studying medicine in foreign countries who could not gain admittance to medical schools in the United States; and the extent to which graduates of foreign medical schools are permitted to practice medicine in the United States.

The Commission is to submit a final report to Congress not later than one year after the enactment of the Act. The report may contain recommendations and proposals for Constitutional amendments, legislation and administrative actions which in its judgment are necessary to carry out its recommendations.

Tax Deductions for Medical Expense Urged

According to a bill (H.R. 6415) introduced April 15 in the House Ways and Means Committee, tax payers, aged 65 and over, would be entitled to increased medical deductions.

Present tax laws provide that a tax payer in this age group may deduct only the amount of medical expenses for medicine and drugs which exceed one per cent of his adjusted gross income. The proposed law would authorize a deduction from gross income equal to the cost of all medicine and drugs if the expenses incurred is primarily for the care of the taxpayer and his spouse.

Chiropractic Bill Introduced

Chiropractic interests are again striving for a passage of legislation which would permit veterans to utilize their services on an out-patient basis on government expense. Although neither House has taken such legislation seriously in the past, proponents of the cause feel that this may be the right time to gain recognition. Sponsors of companion bills are Representative Edith Nourse Rogers of Massachusetts, and Senator William Langer from North Dakota.

Physical Disability—Social Security Benefits Transfer Urged

Representative Charles S. Bugser of California has introduced H.R. 5623 which provides that physical disability determinations for social security benefits shall be transferred from authority of state agencies to that of Department of Health, Education and Welfare.

U. S.-GROUP HEALTH CONDUCT PREPAID MENTAL CARE EXPERIMENT

The Federal Government and Group Health Insurance, Inc., of New York City, have launched an experiment which entitles a cross section of 30,000 Group Health members in Greater New York, psychiatric services in office and hospital at a fraction of the actual cost. The experiment is to be conducted over a two-year trial period with a $300,000 grant from the National Institute of Mental Health to finance the project.

Observers noted that this will mean subsidization of private, voluntary health insurance in order that broader benefits may be received without increased charges. Major part of the expense will be borne by the $600,000 special pool contributed in equal parts by Group Health Insurance and National Institute of Mental Health.

It may be noted that few nonprofit or commercial health insurances in force today provide coverage for mental and nervous ailments or their prevention.

The results of this survey could play an important role in determining the feasibility of broadening benefits and determining future premium costs.

The Art of Medicine

PR

Carl H. Woyke, B.A.
Editor

WHY PEOPLE RESIST VACCINATION EFFORTS, SURVEYS SHOW

Recently, the California Department of Public Health conducted a survey among uninoculated citizens to determine why people resist vaccination efforts. The results indicated that the greatest reasons for not obtaining protection were fear and procrastination.

Of the people interviewed, 14 per cent doubted the safety of the vaccine; 46 per cent of the uninoculated said they were too busy or couldn't be bothered. Expense, according to the survey, was a problem to 15 per cent of those earning under $2,000 a year. Twenty-four per cent of the interviewees with children under six years thought their offspring were too young for the shots.

This year polio inoculation campaigns will be directed toward those hard-to-persuade groups who have resisted previous efforts. If your medical society is planning to round up these stragglers a survey like California's might point up who the laggards are and why they aren't getting their shots. Then publicity can be aimed in the right direction. Contact your local health department, voluntary health agencies or women's auxiliary for help.

For a summary of the progress in poliomyelitis vaccination in Minnesota, see "Polio Protection Step-up Urged by Minnesota Department of Health" in the Public Health section of this issue of MINNESOTA MEDICINE.

RING, TELEPHONE, RING

The telephone is indeed an annoyance as well as a convenience for everyone, notes the president of the Worcester District Medical Society, Worcester, Massachusetts.

For the young physician, the ring of the telephone is the clarion call of a new patient.

For the older physician, it interrupts his office hours and his needed sleep.

For the sick patient, the telephone is a quick way to summon help.

Years ago the sick patients' relative or neighbor came in a buggy or an early model car to the physician's house, routed him out of bed if the hour was late, and brought him to his task.

Now he telephones.

His call is answered by someone.

It may be answered by the impersonal voice of a secretarial service which makes every effort to advise him.

It may be answered by the physician himself.

It is the call that is answered by the physician that is of primary importance to us as a Society.

Most of us realize that when we pick up the telephone to answer a call for help, we represent doctors all over the nation. We do not turn down the call. We are not abrupt. We do not say that we do not make house calls and hang up. We assume responsibility and talk to the caller. We get the name, address, and telephone number. We tell the patient that we will go if we are able and willing.

Very often we are unable to throw on the harness and go to the fire described over the telephone. In such cases a responsible physician sends a doctor in his place.

There is no situation for any of us which calls for a reply that "We do not make house calls," without an offer to send a substitute.

We must be a little better than the better paid plumber and respond to house calls, or send someone in our place.

We respond to calls by picking up the telephone. We assume some measure of

responsibility by that act. Referring the call to the emergency service in this period of our Society's growth does not solve the problem.

We suggest that after picking up the phone that you go and see the patient, or offer to send someone. If the offer is not accepted, responsibility ends. If the offer is accepted, it is better that you find a doctor than for the patient to go through the yellow pages of the telephone without guidance.

In summary: If you pick up the telephone—you are in charge of our public relations.

WHO, WHEN, WHERE, WHY AND WHAT?

Who knows when you, a member of the medical profession, will be called upon to prepare a news release for broadcast or publication.

What you say and how you say it can be best expressed in the form of a news release.

James R. Gay, M.D., Chairman of the Committee on Public Relations of the Northampton County (Pennsylvania) Medical Society, notes the following suggestions for preparation of news releases by individual physicians or county medical societies.

Basically, these suggestions are fundamental in general news writing. However, they have an added perspective because they have been compiled by a member of the medical profession.

"The most effective method of issuing medical news to communications media is to prepare a written news release. It is recommended that each item be drafted and edited several times before being accepted by the authors.

"It is not difficult for a physician to become proficient at writing news stories. One method is to collect sample articles from daily papers and practice styles employed by professional writers.

"*Preparation*—News releases should be double spaced typed on plain white manuscript grade paper stock (8½ x 11). The name of the society is typed in capital letters across the top of each page. Be sure to number pages in upper right corners.

"*Timing of Release*—Most medical news will be offered for immediate use. Type (for immediate release) at beginning of story. If it is desirable to break a story in an evening paper, the release time of 6 a.m. and exact release date should be typed on the first page. Articles for appearance in morning papers should be designated for release at 6 p.m. on specified date.

"*Distribution of Release*—It is recommended that medical news be issued to all area newspapers and radio stations. A copy of the release should be mailed to the Public Relations Committee. In case of doubt about the propriety of the medical news story, it is suggested that the Public Relations Committee be consulted.

"*Avoid Public Controversy*—Medical news should be accurate and factual. Every effort must be made to avoid provoking public controversy. This statement does not imply that the society will refrain from supporting unpopular causes. Controversial subjects should be referred to the president or one of the vice-presidents, for necessary action.

"*Medical News*—Almost everyday, a physician encounters some event of interest to the general public; achievements of members; announcement of meetings; appointment of committees; attendance at national meetings; biography of new members; bulletins during epidemics; election of officers; human interest incidents; medical service developments; participation in community activities; preparation for disasters; preventive medicine suggestions; publications by physicians; scientific advances by members; and scientific programs."

EFFECTIVE PUBLIC RELATIONS URGED TO COMBAT GOVERNMENT MEDICINE

Attainment of the most effective public relations, is essential "if we are to keep medicine in the hands of the medical practitioner and not hand it, by default, to some government agency or bureau," according to Harry J. Loynd, President of Parke, Davis & Company.

In an address delivered before the Michigan Clinical Institute in Detroit, Mr. Loynd warned: "If we are to avoid further Federal legislation, spurred by public misunderstanding, the health team must explore all avenues and join together to support a mutually beneficial program of public information and communication, based on nothing but facts; in short, a good sound public relations program."

He described today's medical care as "the biggest service and commodity bargain that any person will ever buy in their entire lifetime."

Minnesota State Medical Association Roster-1959

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M. A. McCannel, M.D. ..... *Second Vice President* ..... Minneapolis
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K. W. Anderson, M.D. ..... *Treasurer* ..... Minneapolis
H. M. Carryer, M.D. ..... *Speaker, House of Delegates* ..... Rochester
R. P. Buckley, M.D. ..... *Vice Speaker, House of Delegates* ..... Duluth
Harold W. Brunn ..... *Executive Secretary* ..... Saint Paul

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Eighth District
C. L. Oppegaard, M.D. (1960) ..... Crookston
(Chairman)

Ninth District
Clarence Jacobson, M.D. (1959) ..... Chisholm

House of Delegates, American Medical Association

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A. O. Swenson, M.D. (1960) ..... Duluth
George Earl, M.D. (1959) ..... Saint Paul
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Alternates
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Paul Heise, M.D. (1961).....Winona
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John J. Muller, M.D. (1960).....Hibbing
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Eldon Berglund, M.D.....Minneapolis
Tague C. Chisholm, M.D.....Minneapolis
George P. Erickson, M.D.....Hibbing
John J. Galligan, M.D.....Saint Paul
L. E. Harris, M.D.....Rochester
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*New committee appointed for 1959.

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H. E. Drill, M.D.....Hopkins
R. J. Eckman, M.D.....Duluth
H. P. Hinderaker, M.D.....Bird Island
Gerald E. Larson, M.D.....Cambridge
R. L. Page, M.D.....Minneapolis
W. W. Rieke, M.D.....Wayzata
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L. R. Parson.....Elbow Lake
V. A. Doms.....Elbow Lake

HENNEPIN COUNTY
Bernard I. Saliterman.....Minneapolis
Robert D. Semsch.....Minneapolis
Arnold S. Anderson.....Minneapolis
David W. Feigal.....Minneapolis
Harold E. Miller.....Minneapolis

HOUSTON COUNTY
N. T. Norris.....Caledonia
L. K. Onsgard.....Houston
L. A. Knutson.....Spring Grove

HUBBARD COUNTY
W. W. Higgs.....Park Rapids
John Eiler.....Park Rapids

ISANTI COUNTY
W. T. Nygren.....Braham
G. E. Larson.....Cambridge
J. Pone.....Cambridge

ITASCA COUNTY
E. K. Rowles.....Coleraine
R. T. Kelly.....Grand Rapids
M. J. McKenna.....Grand Rapids

JACKSON COUNTY
J. T. Rose.....Lakefield
H. A. Christiansen.....Jackson
W. H. Halloran.....Jackson

KANABEC COUNTY
E. C. Burseth.....Mora

KANDIYOHI COUNTY
Howard Bosland.....Willmar
R. K. Proeschel.....Willmar
Jack Guy.....New London

KITTSON COUNTY
A. Geisbrecht.....Hallock

KOOCHICHING COUNTY
R. D. Hanover.....International Falls
R. A. MacDonald.....Littlefork
C. C. Craig.....International Falls

LAC QUI PARLE COUNTY
C. A. Anderson.....Madison
V. T. Fallan.....Dawson

LAKE COUNTY
Ralph Papermaster.....Two Harbors

LAKE-OF-THE-WOODS
A. A. Brink.....Baudette

LINCOLN COUNTY
A. L. Vadheim.....Tyler

LYON COUNTY
J. E. Murphy.....Marshall
B. C. Ford.....Marshall
W. G. Workman.....Tracy

MARSHALL COUNTY
Carl Holmstrom.....Warren

MARTIN COUNTY
R. C. Hunt.....Fairmont
C. W. Krause.....Fairmont
H. A. Williamson.....Fairmont
Anthony Ourada.....Fairmont
M. J. Lester.....Truman

McLEOD COUNTY
G. L. Griebe.....Brownton
C. O. Bretzke.....Hutchinson
John Smythe.....Lester Prairie

MEEKER COUNTY
Harold Wilmot.....Litchfield
Lennox Danielson.....Litchfield
Fred Schnell.....Litchfield

MILLE LACS COUNTY
Wm. F. McManus.....Princeton

MORRISON COUNTY
A. M. Watson.....Royalton
O. C. Bolstad.....Little Falls
M. L. Hansen.....Little Falls

MOWER COUNTY
L. F. Twiggs.....Austin
J. G. Havens.....Austin

MURRAY COUNTY
B. M. Stevenson.....Fulda
R. F. Pierson.....Slayton
H. D. Patterson.....Slayton

NICOLLET-LE SUEUR COUNTY
D. A. Limbeck.....Le Sueur
H. L. Huffington.....Waterville
R. A. Curtis.....Le Center

NOBLES COUNTY
R. K. Minge.....Worthington
D. E. Nealy.....Adrian
E. A. Kilbride.....Worthington

NORMAN COUNTY
Byron Kinkade.....Ada

OLMSTED COUNTY
N. O. Hanson.....Rochester
J. E. Verby.....Rochester
T. O. Wellner.....Rochester

OTTER TAIL COUNTY
C. A. Boline.....Battle Lake
A. E. Sethre.....Fergus Falls
P. B. Schoeneberger.....Perham
Ralph Estrem.....Fergus Falls

PENNINGTON COUNTY
M. D. Starekow.....Thief River Falls

COUNTY MEDICAL ADVISORY COMMITTEES

PINE COUNTY
A. K. Stratte.....Pine City

PIPESTONE COUNTY
W. G. Benjamin.....Pipestone
J. G. Lohmann.....Pipestone
G. Beckering.....Edgerton

POLK COUNTY
C. G. Uhley.....Crookston

POPE COUNTY
Paul Swedenburg.....Glenwood

RAMSEY COUNTY
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O. O. Rollie.....Saint Paul

RED LAKE COUNTY
Lester Dale.....Red Lake Falls

REDWOOD COUNTY
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S. F. Ceplecha.....Redwood Falls

RENVILLE COUNTY
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H. Hinderaker.....Bird Island

RICE COUNTY
A. W. Nuetzman.....Faribault
Bernard Street.....Northfield
Paul G. Bauer.....Faribault

ROCK COUNTY
C. L. Sherman.....Luverne
A. C. Martin.....Luverne
F. W. Bofenkamp.....Luverne
E. S. Boone.....Luverne
D. M. Odland.....Luverne

ROSEAU COUNTY
Lloyd Klefstad.....Greenbush

ST. LOUIS COUNTY
A. J. Bianco.....Duluth
I. T. Clark.....Duluth
M. O. Wallace.....Duluth

SCOTT COUNTY
H. M. Juergens.....Belle Plaine
Harry N. Simmonds.....Prior Lake
J. E. Ponterio.....Shakopee

SHERBURNE COUNTY
G. H. Tesch.....Elk River

SIBLEY COUNTY
Rolf Hovde.....Winthrop
R. H. Kath.....Arlington
D. C. Olson.....Gaylord

STEARNS-BENTON COUNTY
W. T. Wenner.....St. Cloud
C. S. Donaldson.....St. Cloud
L. A. Veranth.....St. Cloud
J. B. Beuning.....St. Cloud
P. H. Halenbeck.....St. Cloud

STEELE COUNTY
F. C. Anderson.....Owatonna
A. J. Floersch.....Owatonna
T. W. Stransky.....Owatonna

STEVENS COUNTY
O. A. Eide.....Hancock

SWIFT COUNTY
R. P. Griffin.....Benson
Karl L. Helwig.....Kerkhoven
E. J. Kaufman.....Appleton

TODD COUNTY
M. E. Mosby.....Long Prairie
J. M. Cook.....Staples
F. N. Grose.....Clarissa

TRAVERSE COUNTY
A. L. Lindberg.....Wheaton

WABASHA COUNTY
L. M. Ekstrand.....Wabasha
W. P. Gjerde.....Lake City
D. G. Mahle.....Plainview

WADENA COUNTY
L. T. Davis.....Wadena
C. H. Pierce.....Wadena
W. E. Parker.....Sebeka

WASECA COUNTY
S. T. Normann, Jr.....Waseca

WASHINGTON COUNTY
Robert Johnson.....Bayport
J. E. Jenson.....Stillwater
R. E. Carlson.....Stillwater

WATONWAN COUNTY
A. D. Mattson.....Saint James
Herbert Boysen.....Madelia

WILKIN COUNTY
L. O'Brien.....Breckenridge
C. W. Jacobson.....Breckenridge
Neil Kippen.....Breckenridge

WINONA COUNTY
Herbert vR. Heise.....Winona

WRIGHT COUNTY
S. J. Raetz.....Maple Lake
R. M. Sandeen.....Buffalo

YELLOW MEDICINE COUNTY
Carl Lundell.....Granite Falls
O. M. Odlund.....Granite Falls

Woman's Auxiliary to the Minnesota State Medical Association

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Mrs. Rolf M. Iverson.....Minneapolis
Community Service—Mrs. Harold Benjamin
Minneapolis
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(Minnesota Medicine)—
Mrs. John Linner.....Minneapolis

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Minneapolis
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Mrs. D. C. Dahlin.....Rochester
Mrs. Howard F. Polley.....Rochester
Mrs. A. W. Diessner.....Redwood Falls
Today's Health—Mrs. Norval Westby.....Madison

County Society Roster

Key to Symbols as Follows:
***Deceased; †Affiliate, Associate or Life Members, Jr. Associate, and Resident; ‡Military Service; §Wife is Member of Woman's Auxiliary; ¶Honorary Member.**

BLUE EARTH COUNTY MEDICAL SOCIETY

Blue Earth County
Regular meetings, fourth Monday of the month. Annual meeting, second Monday of December
Number of Members—57

President
PENN, GEORGE E. ..... Mankato
Secretary
SANFORD, RAYMOND A. ..... Mankato

§ Anderson, James J. ..... Mankato
Anderson, Margaret C. ..... Mankato
§† Andrews, Roy N. ..... Mankato
§ Batdorf, B. Niles ..... Mankato
† Butzer, John A. ..... Mankato
Butzer, John F. ..... Mankato
§ Chalgren, William S. ..... Mankato
§ Conley, Robert H. ..... Mankato
Dobson, Mervin W. ..... Mankato
§ Engstrom, Robert B. ..... Mankato
§ Eustermann, John J. ..... Mankato
Fortier, Rene G. ..... Mankato
† Franchere, Frederick Wm. ..... Lake Crystal
§ Geurs, Benjamin R. ..... Mankato
§ Gislason, Paul H. ..... Mankato
§ Hammar, Lawrence M. ..... Mankato
Hankerson, Robert G. ..... Minnesota Lake
† Hassett, Roger G. ..... Unknown
§ Heimark, John J. ..... Mankato
§ Heller, Edgar E. ..... Mankato
Hoeper, Philip G. ..... Mankato
§ Howard, Marshall I. ..... Mankato
† Huffington, Herbert L. ..... Lutsen
§ Jones, Orville H. ..... Mankato
† Juliar, Richard O. ..... Los Angeles, California
§ Kaufman, Walter B. ..... Mankato
§ Kearney, Rochfort W. ..... Mankato
† Kemp, Alphonse F. ..... Mankato
§† Koenigsberger, Charles G. ..... Mankato
† Liedloff, Adolph G. ..... Mankato
§ Lindblom, Alton E. ..... No. Mankato
† Luck, Hilda ..... Mankato
Lund, J. Benjamin ..... Mankato
McNear, George R., Jr. ..... Mankato
§ Mickelson, John C. ..... Mankato
† Miller, Victor I. ..... Mankato
§ Morgan, Hugo O. ..... Amboy
§ Olive, John T., Jr. ..... Mankato
§ Penn, George E. ..... Mankato
§ Roth, Frederick D. ..... Mankato
§ Sanford, Raymond A. ..... Mankato
§ Scheidel, Alois M. ..... Mankato
† Schmidt, Paul A. ..... Aurora, Illinois
§ Schmitz, Anthony A. ..... Mankato
§ Sjoding, J. Donald ..... Mankato
§ Smith, Harry J. ..... Lake Crystal
Smith, Paul M. ..... Lake Crystal
§ Snider, Howard R. ..... Mankato
§ Stillwell, Walter C. ..... Mankato
§ Swenson, Donald B. ..... Mankato
§ Thiem, Chester E. ..... Mankato
† Troost, Henry B. ..... Mankato
§ Vezina, John C. ..... Mapleton
§ Von Drasek, Joseph ..... Mankato
§† Wentworth, Albert J. ..... Mankato
† Williams, Hugh O. ..... Lake Crystal
§ Wohlrabe, John C. ..... No. Mankato

BLUE EARTH VALLEY MEDICAL SOCIETY

Martin, Watonwan and Faribault Counties
Regular meetings, third Thursday of each month. Annual meeting in November
Number of Members—50

President
WILLIAMSON, H. A. ..... Fairmont
Secretary
BOYSEN, HERBERT ..... Madelia

§ Anderson, John W. ..... Blue Earth
§ Armstrong, Ralph S. ..... Winnebago
§ Barr, James S. ..... Elmore
Bellomo, John ..... Fairmont
§ Bergman, Oscar B. ..... St. James
§ Boysen, Herbert ..... Madelia
§ Bratrude, Earl J. ..... St. James
† Chambers, Winslow C. ..... Blue Earth
† Cooper, Maurice D. ..... Winnebago
§ Coulter, Harold E. ..... Madelia
§ Drexler, George W. ..... Blue Earth
Feigal, William M. ..... Fairmont
§ Gamm, Edgar R. ..... Triumph
§ Gardner, Jack K. ..... Ceylon
§ Gardner, Victor H. ..... Fairmont
§ Halverson, Donald E. ..... Winnebago
§ Halverson, William G. ..... Madelia
§ Hanson, Lewis ..... Frost
§ Heimark, Julius J. ..... Fairmont
§ Hruza, William J. ..... Madelia
† Hunt, Roscoe C. ..... Fairmont
§ Kraemer, George N. ..... Fairmont
§ Krause, Carl W. ..... Fairmont
§ Lester, Malcolm J., Jr. ..... Truman
§ Lindahl, Merlyn J. ..... Sherburn
Louisell, Charles T. ..... Fairmont
*† McGroarty, John J. ..... Easton
§ Mattson, Albert D. ..... St. James
Mills, John L. ..... Winnebago
§ Moulton, Keith B. ..... St. James
§ Nickerson, John R. ..... Fairmont
§ Nickerson, Neil D. ..... Fairmont
§ Ourada, Anthony L. ..... Fairmont
§ Parsons, R. A. ..... St. James
Parsons, Ralph L. ..... Monterey
† Rovelstad, Roger A. ..... Yonkers, N. Y.
§ Russ, Homer H. ..... Blue Earth
§ Schulz, Robert W. ..... Fairmont
† Smith, Donald V. ..... Mercer Island, Washington
§ Snyder, Clifford D. ..... Kiester
§ Sundberg, Arthur B. ..... Blue Earth
§ Thayer, Ellsworth A. ..... Fairmont
§ Vaughn, Victor A. ..... Truman
§ Virnig, Mark P. ..... Wells
§ Virnig, Richard P. ..... Wells
§ Wandke, Otto E. ..... Fairmont
§ Watkins, John A. ..... Wells
§ Williamson, Harold A. ..... Fairmont
† Wilson, Clyde E. ..... Blue Earth
§ Zemke, Erhart E. ..... Fairmont

BROWN COUNTY MEDICAL SOCIETY

Brown County
Regular meetings, quarterly. Annual meeting in February
Number of Members—31

President
KITZBERGER, PETER J. ..... New Ulm
Secretary
CARTHEY, FRANK J. ..... New Ulm

§ Black, William A. ..... New Ulm
§ Boyle, Francis J. ..... Springfield
Burnett, Joseph W. ..... New Ulm
Cairns, Robert J. ..... Redwood Falls
§ Carthey, Frank J. ..... New Ulm
Dysterheft, Adolf F. ..... Gaylord
§ Fesenmaier, Otto B. ..... New Ulm
§ Fritsche, Albert ..... New Ulm
§ Fritsche, Carl J. ..... New Ulm
§ Fritsche, Theodore R. ..... New Ulm
Goblirsch, Andrew P. ..... Sleepy Eye
Hovde, Rolf ..... Winthrop
§ Kaiser, Milton L. ..... New Ulm
§ Keithahn, Elmer E. ..... Sleepy Eye
§ Kitzberger, Peter J. ..... New Ulm
§ Kruzich, Stephen J. ..... Sleepy Eye
† Kusske, Arthur L. ..... New Ulm
§ Muesing, William J. ..... New Ulm
† Nuessle, Walter G. ..... Springfield
§ Penk, Engward L. ..... Springfield
Peterson, Roy A. ..... Vesta
Rimas, Matthew J. ..... Comfrey
Roan, Morton ..... Ellendale
§ Saffert, Cornelius A. ..... New Ulm
§ Schroeppel, John E. ..... Winthrop
Seifert, Otto J. ..... New Ulm
Sturgis, John A. ..... Lamberton
§ Tesar, Charles ..... New Ulm
§ Vogel, Howard A. L. ..... New Ulm
Wohlrabe, Donald E. ..... Springfield
Wohlrabe, Edwin J. ..... Springfield

CAMP RELEASE DISTRICT MEDICAL SOCIETY

Chippewa, Lac Qui Parle and Yellow Medicine Counties
Regular meetings, second Thursday each month. Annual meeting in November
Number of Members—30

President
WESTBY, NORVAL M.....Madison
Secretary
ANDERSON, CHESTER A.....Madison
Anderson, Chester A.....Madison
§ Barr, Ronald W.....Montevideo
§ Boody, George J., Jr.....Sandstone
Burns, Floyd M.....Milan
Burns, M. Alpheus.....Milan
§ Camp, Ray Junior.....Madison
Fallon, Virgil T.....Dawson
§ Hauge, Malvin I.....Clarkfield
† Holmberg, LeRoy J.....Canby
§ Hudec, Elwyn R.....Echo
† Hustad, Edward G.....Minneapolis
§ Johnson, Vilhelm M.....Dawson
† Jordan, Kathleen B. Smith.....Granite Falls
Jordan, Lewis S.....Granite Falls
§ Kaufman, William C.....Appleton
Krystosek, Lee A.....Janesville, Wisconsin
Larson, Arthur N.....Fergus Falls
§ Lima, Ludvig R., Jr.....Montevideo
§ Lundell, Carl L.....Granite Falls
Maus, Philip.....Dawson
§ Miller, William P.....Montevideo
Niazi, Suada.....Clarkfield
§ Odland, Olin M.....Granite Falls
§ Owens, William A.....Montevideo
Pertl, Albert L.....Canby
§ Roust, Henry A.....Montevideo
§ Schmidt, Paul G., Jr.....Granite Falls
§ Westby, Norval M.....Madison

CLAY-BECKER COUNTY MEDICAL SOCIETY

Clay and Becker Counties
Regular meetings, three per year. Annual meeting in November
Number of Members—30

President
CARLSON, V. J.....Moorhead
Secretary
OLIVER, JAMES O.....Moorhead
§ Bigler, Earl E.....Perham
Bigler, Ivan E.....Perham
§ Bottolfson, Bottolf T.....Moorhead
§ Carlson, Vernon J.....Moorhead
§ Dodds, William C.....Detroit Lakes
§ Duncan, James W.....Moorhead
§ Geib, Marvin J.....Fargo, No. Dak.
† Hagen, Olaf J.....Moorhead
§ Holten, John.....Moorhead
§ Houglum, Arvid J.....Lake Park
Humphrey, Edward W.....Moorhead
Johnson, Olga H.....Moorhead
Koons, W. R.....Mahnomen
§ Larson, Arnold.....Detroit Lakes
§ Lorentzen, Ernest S.....Detroit Lakes
Marsovszky, Paul J.....Moorhead
§ Midthune, Andreen S.....Lake Park
§ Moberg, Clarence W.....Detroit Lakes
Odland, Mark E.....Detroit Lakes
§ Oliver, James.....Moorhead
† Otto, Henry C.....Frazee
§ Rice, Hagbart G.....Moorhead
§ Rutledge, John B.....Detroit Lakes
Rutledge, Lloyd H.....Detroit Lakes
Saxman, Gertrude.....Georgetown
§ Simison, Carl.....Barnesville
† Thysell, Fred A.....Moorhead
§ Thysell, Vernon D.....Hawley
Watson, Robert H.....Detroit Lakes
§ Watson, Virgil A.....Detroit Lakes

EAST CENTRAL MINNESOTA MEDICAL SOCIETY

Anoka, Chisago, Isanti, Kanabec, Mille Lacs, Pine and Sherburne Counties
Regular meetings, second Tuesday of every other month of the year
Annual meeting, second Tuesday in December
Number of Members—46

President
SWENSON, ROY G.....North Branch
Secretary
TESCH, GORDON H.....Elk River
§ Adkins, Galen H.....Sandstone
Ahlstrom, Robert C.....Braham
Albrecht, Harold H.....Lindstrom
§ Berge, Harry L.....Mora
Berglund, Alvin E.....Cambridge
† Bossert, Clarence S.....Mora
§ Bunker, Bevan W.....Anoka
§ Burseth, Edgar C.....Mora
Corteau, Robert D.....Onamia
§ Davis, William I.....Sandstone
*† Dredge, Homer P.....Minneapolis
Gailitis, Veronika M.....Cambridge
Gully, Raymond J.....Fort Meade, So. Dak.
Halpin, Joseph E.....Rush City
Henry, Harold W.....Hinckley
Holmes, Alva E.....Rush City
Huber, Robert W.....St. Croix Falls
§ Hubin, Edwin G.....Sandstone
Johnson, Aldridge F.....Isle
Kapsner, Alfred T.....Princeton
† Kelsey, Carleton G.....St. Paul
Larson, Gerald E.....Cambridge
§ McManus, William F.....Princeton
Mach, Ralph F.....Pine City
§ Magnuson, Raymond C.....Cambridge
Metcalf, Norman B.....Princeton
Nelson, Luther A.....Rush City
§ Nordman, Willard F.....Mora
Nygren, William T.....Braham
Peterson, Alvin C.....Mora
Peterson, Donald B.....Anoka
Pone, John.....Cambridge
Popovich, Dragojla.....Anoka
§ Roehlke, Arthur B.....Elk River
Schut, John W.....Anoka
§ Spurzem, Raymond J.....Anoka
§ Stratte, Alf K.....Pine City
§ Swenson, Roy G.....North Branch
§ Tesch, Gordon H.....Elk River
Textor, Jerome.....Anoka
Thomas, W. H.....Howard Lake
Vik, Melvin.....Cambridge
Wadsworth, George L.....Cambridge
† Waller, Joseph D.....Pine City
† Woyda, William C.....Minneapolis
§ Zinn, Charles W.....Elk River

FREEBORN COUNTY MEDICAL SOCIETY

Freeborn County
Regular meetings, third Thursday of even numbered months. Annual meeting, December
Number of Members—35

President
NEEL, HARRY B.....Albert Lea
Secretary
STEINER, LEON E.....Albert Lea
§ Barr, Lowell C.....Albert Lea
§ Bartness, John.....Albert Lea
† Burns, Catherine.....Excelsior
Butturf, Carl R.....Freeborn
†§ Calhoun, Frank W.....Albert Lea
§ Denio, Robert A.....Albert Lea
§ Donovan, Daniel L.....Albert Lea
§ Egge, Sanford G.....Albert Lea
§ Ellertson, Leonard M.....Albert Lea
§ Erdal, Ove A.....Albert Lea
§ Folken, Frank G.....Albert Lea
† Freeman, John P.....Glenville
§ Gamble, Elbert J.....Albert Lea
§ Gill, Theodore M.....Albert Lea
† Gullickson, Andrew.....Minneapolis
§ Hansen, Theodore M.....Albert Lea
§ Holian, Darwin K.....Albert Lea
† Kaasa, Lawrence J.....Albert Lea
§ Keil, Marcus A.....Albert Lea
† Leopard, Brand A.....Brownsville, Texas
§ Menefee, Edward C.....Albert Lea
§ Neel, Harry B.....Albert Lea
Nelson, Charles H.....Albert Lea
§ Nelson, Clayton E.....Albert Lea
† Nelson, Wilhma B.....Albert Lea
§ Nesheim, Martin O.....Emmons
§ Palmer, Clinton F.....Albert Lea
§ Person, John P.....Albert Lea
§ Prins, Leo R.....Albert Lea
§ Schmidt, Ruben F.....Alden
*† Schultz, J. Albert.....Albert Lea
§ Sherman, Alfred G.....Albert Lea
§ Steiner, Leon E.....Albert Lea
§ Whitson, Sidney A.....Albert Lea
§ Wilcox, G. Charles.....Albert Lea

GOODHUE COUNTY MEDICAL SOCIETY

Goodhue County
Regular meetings, third Thursday. Annual meeting, December
Number of Members—23

President
HAMILTON, SAMUEL L. ..... Red Wing

Secretary
WASMUND, CLARENCE W. ..... Red Wing

† Aanes, Almer M. ..... Red Wing
§ Ahern, Gene J. ..... Red Wing
§ Akins, Willard M. ..... Red Wing
§ Billings, Harry H. ..... Red Wing
§ Brusegard, James F. ..... Red Wing
Douglass, Jesse E. ..... Cannon Falls
Falls, John L. ..... Red Wing
§ Graves, Richard B. ..... Red Wing
Halvorson, James W. ..... Zumbrota
§ Hamilton, Samuel L. ..... Red Wing
§ Hartnagel, Grant F. ..... Red Wing
§ Hawley, George M. B., II ..... Red Wing
§ Juers, Edward H. ..... Red Wing
§ Larson, Oliver E. H. ..... Zumbrota
§ Liffrig, William W. ..... Red Wing
§ Miller, Winston R. ..... Red Wing
Molenaar, Robert E. ..... Cannon Falls
§ Sherman, Royal V. ..... Red Wing
† Smith, Myron W. ..... Red Wing
§ Steffens, Leon A. ..... Red Wing
§ Walter, William E. ..... Wanamingo
§ Wasmund, Clarence W. ..... Red Wing
§ Williams, Marland R. ..... Cannon Falls

HENNEPIN COUNTY MEDICAL SOCIETY

Hennepin County
Regular meetings, first Monday of each month (October through May).
Annual meeting, first Monday in October
Number of Members—1,092

President
YLVISAKER, RAGNVALD S. ..... Minneapolis

Secretary
HOLMBERG, CONRAD J. ..... Minneapolis

Exec. Sec'y
COOK, THOMAS P. ..... Minneapolis

Abramson, Milton ..... Minneapolis
§ Abullarade, Jose A. ..... Minneapolis
§ Adkins, Charles D. ..... Minneapolis
§ Agustsson, Hreidar ..... Minneapolis
§ Ahern, Eugene E. ..... Minneapolis
Alari, Heino ..... Minneapolis
§ Alexander, Harlan A. ..... Minneapolis
§ Aling, Charles A. ..... Minneapolis
† Altnow, Hugo O. ..... Coral Gables, Fla.
§ Amatuzio, Donald S. ..... Minneapolis
Anderegg, Alfred F. ..... Minneapolis
*§Andersen, Silas C. ..... Minneapolis
§ Anderson, Arnold S. ..... St. Louis Park
§ Anderson, David M. ..... St. Louis Park
† Anderson, Edward D. ..... Gstaad, Switzerland
§ Anderson, Ernest R. ..... Minneapolis
§ Anderson, Frank J. ..... Minneapolis
Anderson, John A. ..... Minneapolis
§ Anderson, Karl W. ..... Minneapolis
§ Anderson, Richard W. ..... Minneapolis
Anderson, Roger L. ..... Minneapolis
§ Anderson, U. Schuyler ..... Minneapolis
Anderson, Wallace E. ..... Minneapolis
§ Anderson, William H. ..... Minneapolis
§ Anderson, William T. ..... Minneapolis
† Andreassen, Einar C. ..... Minneapolis
§ Andreassen, Rolf L. ..... Minneapolis
§ Andresen, Karl d'A. ..... Minneapolis
§ Andrews, Robert S. ..... Minneapolis
§ Ankner, Frank J. ..... Minneapolis
§ Anonsen, Richard E. ..... Minneapolis
Ansell, Julian S. ..... Minneapolis
† Arends, Archabald L. ..... Minneapolis
§ Arey, Stuart Lane ..... Minneapolis
§ Arhelger, Stuart W. ..... Minneapolis
§ Arlander, Clarence E. ..... Minneapolis
§ Arling, Leonard S. ..... Minneapolis
§ Arms, James J. ..... Minneapolis
Armstrong, Byron H. ..... Hopkins
Arnold, Ann W. ..... Minneapolis
Arvidson, Carl G. ..... Minneapolis
Azad, A. M. ..... Minneapolis
§ Baggenstoss, Osmond J. ..... Minneapolis
§ Bagley, Russell W. ..... Minneapolis
§ Baird, Joseph W. ..... Minneapolis
§ Baken, Melvin P. ..... Minneapolis
§ Baken, Melvin P., Jr. ..... Minneapolis
Baker, Abe B. ..... Minneapolis
† Baker, Alfred T. ..... Minneapolis
§ Baker, Milton E. ..... Minneapolis
Bakke, Arnold C. ..... Minneapolis
§ Baleisis, Peter ..... Minneapolis
§ Balkin, Samuel G. ..... Minneapolis
§ Balogh, Charles J. ..... Minneapolis
Bank, Harry E. ..... Minneapolis
§ Barnett, Robert M. ..... Minneapolis
§ Barno, Alex ..... St. Louis Park
Barr, Maxwell M. ..... Minneapolis
Barr, Robert N. ..... Minneapolis
Barron, Jesse J. ..... Minneapolis
†§Barron, Moses ..... Minneapolis
Barron, S. Steven ..... Minneapolis
Beach, Northrop ..... Minneapolis
§ Bedford, Edgar W. ..... Minneapolis
§ Beirstein, Samuel ..... Minneapolis
§ Beiswanger, Richard H. ..... Minneapolis
Bell, Donald C. ..... Minneapolis
† Bell, Elexious T ..... Minneapolis
§ Bellville, Titus P. ..... Minneapolis
§ Belzer, Meyer S. ..... Minneapolis
Benesh, Louis A. ..... Minneapolis
§ Benjamin, Edwin G. ..... Minneapolis
§ Benjamin, Harold G. ..... Minneapolis
Benjamin, Robert B. ..... Minneapolis
Berg, Clinton C. ..... Wayzata
Berger, Alex G. ..... Minneapolis
§ Bergh, George S. ..... Minneapolis
Bergh, Solveig M. ..... Minneapolis
§ Berglund, Eldon B. ..... Minneapolis
§ Bergquist, James R. ..... Minneapolis
§ Berkwitz, Nathaniel J. ..... Minneapolis
Berman, Reuben ..... Minneapolis
Bernstein, Irving C. ..... Minneapolis
§ Berris, Harold ..... Minneapolis
§ Bessesen, Alfred N. ..... Minneapolis
§ Bevis, William D. ..... Minneapolis
Bieter, Raymond N. ..... Minneapolis
§ Bilka, Paul J. ..... Minneapolis
§ Binder, Manuel R. ..... Minneapolis
Bittick, Wilbur H. ..... Minneapolis
§ Blake, Allan J. ..... Hopkins
§ Blake, James A. ..... Hopkins
§ Blake, Paul S. ..... Hopkins
§ Bloedel, Traugott J. ..... Osseo
§ Blomberg, Robert D. ..... Minneapolis
Bloom, David ..... Minneapolis
§ Bloom, Norman B. ..... Minneapolis
§ Blumenthal, Jacob S. ..... Minneapolis
§ Boehrer, John J. ..... Minneapolis
§ Bofenkamp, Benjamin ..... Minneapolis
§ Bohn, Donald G. ..... Minneapolis
§ Boies, Lawrence R. ..... Minneapolis
† Booth, Albert E. ..... Minneapolis
† Boreen, Clifton A. ..... Minneapois
† Borgeson, Egbert J. ..... St. Paul
§ Borman, Chauncey N. ..... Minneapolis
§ Borowicz, Leonard A. ..... Minneapolis
§ Bowers, Gordon G. ..... Minneapolis
Boynton, Ruth E. ..... Minneapolis
Bradley, Jeanne B. ..... Minneapolis
Bradley, John G. ..... Minneapolis
Brandt, Henry E. ..... Minneapolis
†§Bratrud, Arthur F. ..... Minneapolis
Bravick, Donald D. ..... Minneapolis
Breitenbucher, Robert B. ..... Minneapolis
§ Brekke, Harvey J. ..... Minneapolis
§ Bridge, Allyn G. ..... Minneapolis
Brill, Alice K. ..... Minneapolis
† Brooks, Charles N. ..... Minneapolis
† Brown, Edgar D. ..... St. Petersburg, Florida
Brown, William D. ..... Minneapolis
§ Buchstein, Harold F. ..... Minneapolis
Buckley, Joseph J. ..... Minneapolis
§ Buirge, Raymond E. ..... Minneapolis
*†Bulkley, Kenneth ..... Minneapolis
§ Burnham, Wesley H. ..... Minneapolis
§ Bushard, Wilfred J. ..... Minneapolis
§ Buzzelle, Leonard K. ..... Minneapolis
§ Cable, Morris L. ..... Minneapolis
§ Cabot, Clyde M. ..... Minneapolis
§ Cady, Laurence H. ..... Minneapolis
Cameron, Isabell L. ..... Minneapolis
† Campbell, Lowell M. ..... Minneapolis
§ Campbell, Orwood J. ..... Minneapolis
§ Caplan, Leslie ..... Minneapolis
§ Card, William H. ..... Minneapolis
§ Carey, James B. ..... Minneapolis
Carey, James B., Jr. ..... Minneapolis
§ Carlander, Lester W., Jr. ..... Minneapolis
§ Carlson, Charles V. ..... Mound
Carlson, Lawrence ..... Minneapolis
§ Carlson, Leonard T. ..... Minneapolis
§ Caron, Robert P. ..... Minneapolis
§ Carr, William J. ..... Minneapolis
§ Caspers, Carl G. ..... Minneapolis
Cauble, Charles F. ..... Minneapolis
†§Cavanor, Frank T. ..... Minneapolis
§ Ceder, Elmer T. ..... Minneapolis
§ Cella, Joseph A. ..... Minneapolis
§ Chadbourn, Wayne A. ..... Minneapolis
Challman, Alan ..... Minneapolis
† Chavez, Demetrio A. ..... St. Paul
§ Chesler, Merrill D. ..... Minneapolis
§ Child, Sherman B. ..... Minneapolis
§ Chisholm, Tague C. ..... Minneapolis
§ Christensen, Llewellyn E. ..... Minneapolis
Clark, Malcolm D. ..... Minneapolis
§ Clark, Robert S. ..... Minneapolis
§ Clay, Lyman B. ..... Minneapolis
§ Cochrane, Ray F. ..... Minneapolis
Coe, John I. ..... Minneapolis
§ Cohen, Bernard A. ..... Minneapolis
Cohen, Ephriam B. ..... Minneapolis
Cohen, Henry W. ..... Minneapolis
† Cohen, Maynard M. ..... Minneapolis
§ Cohen, Sumner S. ..... Oak Terrace
§ Cole, James S. ..... Minneapolis
§ Cooper, Robert R. ..... Minneapolis
Corniea, Albert D. ..... Minneapolis
§ Correa, Dale H. ..... Minneapolis
Cowan, Donald W. ..... Minneapolis
Craig, M. Elizabeth ..... Minneapolis
†§Cranmer, Richard R. ..... Minneapolis
Cranston, Robert W. ..... Minneapolis
§ Creevy, Charles D. ..... Minneapolis
§ Culligan, Leo C. ..... Minneapolis
§ Cundy, Donald T. ..... Minneapolis
Cushing, Richard T. ..... Minneapolis
† Cutts, George ..... Minneapolis
§ Daggett, Donald R. ..... Minneapolis
§ Dahl, Elmer O. ..... Minneapolis
Dahl, James C. ..... Minneapolis
§ Dahl, John A. ..... Minneapolis
† Daniel, Donald H. ..... Minneapolis
Danyluk, Michael ..... Minneapolis
§ Dargay, Cyril P. ..... Minneapolis
§ David, Reuben ..... Hopkins
§ Davis, Jay C. ..... Minneapolis
del Plaine, Carlos W. ..... Minneapolis
§ Devereaux, Thomas J. ..... Wayzata
Dickman, Roy W. ..... Minneapolis
§ Diefenbach, Eugene J. ..... Minneapolis
Diehl, Harold S. ..... New York
§ Dierker, Heinrich A. ..... Minneapolis
Diessner, Henry D. ..... Minneapolis
§ Doan, Robert E. ..... Wayzata
§ Donatelle, Edward P. ..... Minneapolis
§ Dorge, Richard I. ..... Minneapolis
§ Dorsey, George C. ..... Minneapolis
Dorsey, George C., Jr ..... Minneapolis
Doscherholmen, Alfred ..... Minneapolis
† Doxey, Gilbert L. ..... Minneapolis
§ Doyle, Lawrence O. ..... Minneapolis
†§Drake, Charles R. ..... Minneapolis
§ Drill, Herman E. ..... Hopkins
Duff, Edwin R. ..... Minneapolis
§ Dummer, Donald J. ..... New Brighton
§ Dunlap, Earl H. ..... Minneapolis
§ Dupont, Joseph A. ..... Excelsior

§ Duryea, Marbry ..... Minneapolis
§ Duryea, Willis M. ..... Minneapolis
§ Duryea, Willis M., Jr. ..... Minneapolis
§ Dvorak, Benjamin A ..... Minneapolis
§ Dwan, Paul F. ..... Minneapolis
§ Dworsky, Samuel D. ..... Minneapolis
§ Eder, Walter P ..... Minneapolis
§ Ehrenberg, Claude J. ..... Minneapolis
§ Ehrlich, S. Paul ..... Minneapolis
§ Eich, Matthew A. ..... Minneapolis
§ Eichhorn, Edmund P., Jr. ..... Minneapolis
§ Eisenstadt, David H. ..... Minneapolis
§ Eisenstadt, William S. ..... Minneapolis
§ Eitel, George D. ..... Minneapolis
§ Eli, Earl W. ..... Minneapolis
§ Ellison, David E. ..... Minneapolis
§ Ellison, Ellis ..... Minneapolis
§ Ellison, Evan S. ..... Minneapolis
§ Ellwood, Paul M., Jr. ..... Minneapolis
§ Elrod, Calvin R. ..... Long Lake
§ Emond, Albert J. ..... Farmington
§ Emond, Joseph S. ..... Farmington
§ Engel, Joseph P. ..... Minneapolis
§ Engelhart, Peter C. ..... Minneapolis
§ Englund, Elvin F. ..... Minneapolis
§ Engstrand, Oscar J. ..... Minneapolis
§ Erickson, Clifford O. ..... Minneapolis
§ Erickson, Laurence F. ..... Minneapolis
§ Erickson, Myron E. ..... Minneapolis
§ Erickson, Reuben F. ..... Minneapolis
§ Erlanson, Andrew C. ..... Minneapolis
§ Esensten, Sidney ..... Minneapolis
§ Etzwiler, Donnell D. ..... Minneapolis
§ Evans, Edward T. ..... Minneapolis
§ Evans, Robert D. ..... Minneapolis
† Fahr, George E. ..... Minneapolis
§ Fansler, Walter A. ..... Minneapolis
§ Feeney, John M. ..... Minneapolis
§ Feigal, David W. ..... Wayzata
§ Feinberg, Philip ..... Wayzata
§ Feinberg, Samuel B. ..... Wayzata
§ Feinstein, Julius Y. ..... Wayzata
§ Fenger, Ejvind P. K. ..... Oak Terrace
§ Field, Charles W. ..... Minneapolis
§ Fifer, William R. ..... Minneapolis
§ Fingerman, David L. ..... Minneapolis
§ Fink, Leo W. ..... Minneapolis
§ Fink, Robert J. ..... Minneapolis
§ Fink, Walter H. ..... Minneapolis
§ Fisher, Don H. ..... Minneapolis
§ Fisher, Isadore ..... Minneapolis
*† FitzGerald, Don F. ..... Wayzata
† Fjeldstad, C. Alford ..... Minneapolis
§ Fleeson, William H. ..... Minneapolis
§ Fleming, Dean S. ..... Hopkins
§ Fliehr, Richard R. ..... Minneapolis
§ Flink, Edmund B. ..... Minneapolis
§ Foker, Leslie W. ..... Minneapolis
§ Folsom, Louis B. ..... Minneapolis
§ Ford, William H. ..... Minneapolis
§ Foster, Orley W. ..... Minneapolis
‡§ Fowler, L. Haynes ..... Newport Beach, Calif.
† Fox, Donald P. ..... Tanganyika, East Africa
§ Fox, James Rogers ..... Minneapolis
§ Frane, Donald B. ..... Minneapolis
§ Fredericks, George M. ..... Minneapolis
‡ Freeman, Craig ..... Fort McPherson, Georgia
Freeman, Donald W. ..... St. Louis Park
§ French, Lyle A. ..... Minneapolis
§ Frey, Richard J. ..... Minneapolis
§ Friberg, Joseph B. ..... Minneapolis
§ Fried, Louis A. ..... Minneapolis
§ Friedell, Aaron ..... Minneapolis
Friedell, George ..... St. Louis Park
Friedlieb, Oskar P. ..... Minneapolis
§ Friedman, Harry S. ..... Minneapolis
§ Frost, John B. ..... Minneapolis
§ Frost, Russell H. ..... Oak Terrace
§ Frykman, Howard M. ..... Minneapolis
§ Frys, Russell N. ..... Minneapolis
† Fuller, Alice H. ..... Minneapolis
§ Funk, Victor K. ..... Oak Terrace
§ Furman, Christine ..... Minneapolis
§ Fusaro, Ramon M. ..... Minneapolis
§ Gaard, Richard C. ..... Minneapolis
Galejs, Aina ..... Minneapolis
§ Gallett, Lester E. ..... Minneapolis
† Galligan, Margaret Mary D. ..... Minneapolis
§ Gammell, John H. ..... Minneapolis
§ Garamella, Joseph J. ..... Minneapolis
§ Garske, George L. ..... Minneapolis
§ Garten, Joseph L. ..... Minneapolis
§ Garvey, James T. ..... Minneapolis
§ Gault, N. L., Jr. ..... Minneapolis
† Gault, Sarah J. ..... Minneapolis
§ Gaviser, David ..... Minneapolis
§ Geller, Joseph ..... Minneapolis
§ George, Vane P., Jr. ..... Minneapolis
§ Gibbs, Robert W. ..... Minneapolis
§ Giebenhain, John N. ..... Minneapolis
§ Giere, Joseph C. ..... Minneapolis
§ Giere, Richard W. ..... Minneapolis
§ Gilbert, Maurice G. ..... Minneapolis
§ Gilbertsen, Victor A. ..... Minneapolis
§ Gingold, Benjamin A. ..... Minneapolis
*† Girvin, Richard B. ..... Des Peres, Mo.
§ Glaeser, John H. ..... Minneapolis
‡§ Glassberg, Irving J. ..... Minneapolis
Glueck, Bernard C., Jr. ..... Minneapolis
Godfrey, H. Wilson ..... Minneapolis
Goetz, Frederick C. ..... Minneapolis
§ Gold, David ..... Minneapolis
§ Goldberg, Isadore M. ..... Minneapolis
Goldberg, Marvin E. ..... Minneapolis
§ Goldman, Theodore I. ..... Minneapolis
§ Goldner, Meyer Z. ..... Minneapolis
§ Goltz, Robert W. ..... Minneapolis
Good, Gary ..... Minneapolis
§ Good, Hoff D. ..... Minneapolis
Goodchild, William R. ..... Minneapolis
Gordon, John R. ..... Minneapolis
Gordon, Philip E. ..... Minneapolis
§ Gordon, Sewell S. ..... St. Louis Park
Grant, Suzanne ..... Minneapolis
†§ Gratzek, Frank R. ..... Minneapolis
Gray, Royal C. ..... Minneapolis
Green, Clayton Robbie ..... Excelsior
Green, Robert A. ..... St. Louis Park
§ Greenberg, Albert J. ..... Minneapolis
§ Greenfield, Irving ..... Minneapolis
Greenspan, Richard H. ..... Minneapolis
¶ Greisheimer, Esther M. ..... Philadelphia, Pa.
Grimes, Marian ..... Minneapolis
§ Grimmell, Francis J. ..... Minneapolis
Grismer, Jerome T. ..... Minneapolis
§ Gronvall, Paul R. ..... Minneapolis
§ Grotting, John K. ..... Minneapolis
Gruys, Robert I. ..... Minneapolis
§ Gullickson, Glenn, Jr. ..... Minneapolis
§ Gunlaugson, Frederick G. ..... Minneapolis
§ Gustafson, Paul O. ..... Minneapolis
§ Gustason, Harold T. ..... Minneapolis
Haberer, Helen R. ..... Minneapolis
§ Haberland, Lyle F. ..... Minneapolis
§ Haberle, Charles A. ..... Minneapolis
§ Hagen, Kristofer ..... Minneapolis
§ Hagen, Wayne S. ..... Minneapolis
† Haggard, George D. ..... Minneapolis
§ Hall, Harry B. ..... Minneapolis
§ Hall, Wendell H. ..... Minneapolis
Hambidge, Gove, Jr. ..... Minneapolis
§ Hamel, Joseph I. ..... Minneapolis
Hammerstrom, Robert N. ..... Minneapolis
§ Hannah, Hewitt B. ..... Minneapolis
§ Hansen, Cyrus O. ..... Minneapolis
§ Hansen, Erling W. ..... Minneapolis
Hansen, Olga S. ..... Minneapolis
§ Hansen, Rollin M. ..... Minneapolis
§ Hanske, Edward A. ..... Minneapolis
§ Hanson, Harlow J. ..... Minneapolis
Hanson, Harold B. ..... Minneapolis
Hanson, Harold W. ..... Minneapolis
† Hanson, Henry V. ..... St. Paul
§ Hanson, Malcolm B. ..... Minneapolis
§ Hanson, Mark C. L. ..... Minneapolis
§ Hanson, William A. H. ..... Minneapolis
Hanson, William B. ..... Minneapolis
Happe, Lawrence J. ..... Minneapolis
§ Harris, Leon D. ..... Minneapolis
§ Harrison, William C. ..... Minneapolis
Hartman, Evelyn E. ..... Minneapolis
Hartwig, John A. ..... Minneapolis
§ Hass, Frederick M. ..... Minneapolis
§ Hastings, DeForest R. ..... Minneapolis
§ Hastings, Donald W. ..... Minneapolis
§ Hauge, Erling T. ..... Minneapolis
§ Haugen, George W. ..... Minneapolis
Haugen, John A. ..... Minneapolis
§ Hauser, Donald C. ..... Minneapolis
Hauser, George W. ..... Minneapolis
§ Havel, Robert J. ..... Minneapolis
§ Haven, Walter K. ..... Minneapolis
§ Hawkinson, Raymond P. ..... Minneapolis
§ Hay, Lyle J. ..... Minneapolis
† Hayes, James M. ..... Arcadia, California
§ Hays, Albert T. ..... Minneapolis
§ Head, Douglas P. ..... Minneapolis
§ Hebbel, Robert ..... Minneapolis
† Hendrickson, John F. ..... Minneapolis
§ Henrikson, Earl C. ..... Minneapolis
† Henry, Clifford E. ..... Kirksville, Mo.
Herbert, Willis L. ..... Minneapolis
§ Hermann, Harold W. ..... Minneapolis
*† Higgins, John H. ..... Minneapolis
Hilgermann, George O. ..... Minneapolis
Hill, Earl ..... Minneapolis
§ Hill, Elmer M. ..... Minneapolis
† Hillis, Samuel J. ..... E. Bradenton, Fla.
Hinckley, Robert G. ..... Minneapolis
*§ Hirshfield, Frank R. ..... Minneapolis
§ Hitchcock, Claude R. ..... Minneapolis
§ Hodges, Kenneth V. ..... Minneapolis
Hoffbauer, Frederick W. ..... Minneapolis
§ Hoffert, Henry E. ..... Minneapolis
§ Hoffman, Roy A ..... Minneapolis
§ Hoffman, Walter L. ..... Minneapolis
§ Holmberg, Conrad J. ..... Minneapolis
§ Holzapfel, Fred C. ..... Minneapolis
§ Hoppes, Emerson E. ..... Minneapolis
Horns, Howard L. ..... Minneapolis
§ Horns, Richard C. ..... Minneapolis
Hoseth, Wayne L. ..... Minneapolis
Houkom, Bjarne ..... Minneapolis
§ Houle, Rollin J. ..... New Brighton
Hovland, Melvin L. ..... Minneapolis
§ Howard, Robert B. ..... Minneapolis
Howard, Solomon E. ..... Minneapolis
§ Howell, Carter W. ..... Minneapolis
Hudson, George E. ..... Minneapolis
† Huenekens, Edgar J. ..... Minneapolis
§ Hulteng, Donald B. ..... Minneapolis
§ Hultkrans, Rudolph E. ..... Minneapolis
*† Hurd, Annah ..... Minneapolis
Hutchinson, Dorothy W. ..... Oak Terrace
§ Hymes, Charles ..... Minneapolis
† Hynes, John E. ..... Minneapolis
Ide, Arthur W., Jr. ..... Minneapolis
§ Idstrom, Linneus G. ..... Minneapolis
§ Indeck, Walter ..... Minneapolis
§ Ingalls, Edgar G. ..... Minneapolis
† Irvine, Harry G. ..... Minneapolis
§ Iverson, Rolf M. ..... Minneapolis
Jackson, J. Albert ..... Minneapolis
§ Jacobson, Loren J. ..... Rochester
§ Jacobson, Wyman E. ..... St. Louis Park
§ Janda, George W., Jr. ..... Minneapolis
§ Jay, Alan R. ..... Minneapolis
§ Jedrzejewski, Walter Jay ..... Minneapolis
§ Jefferies, William L. ..... St. Louis Park
§ Jensen, Harry C. ..... Minneapolis
† Jensen, Marius J. ..... Minneapolis
Jensen, Nathan K. ..... Minneapolis
Jensen, Reynold A. ..... Minneapolis
§ Jepson, William W. ..... Minneapolis
Jerome, Bourne ..... Minneapolis
Jerome, Elizabeth K. ..... Minneapolis
Jeub, Robert P. ..... Minneapolis
§ Johnson, Angelo G. ..... Minneapolis
§ Johnson, Arthur B. ..... Minneapolis
§ Johnson, David R. ..... Minneapolis
§ Johnson, Edward A. ..... Minneapolis
§ Johnson, Frank E. ..... Minneapolis
§ Johnson, Harry A. ..... Minneapolis
†§ Johnson, James A. ..... Minneapolis
§ Johnson, John W. ..... Minneapolis
§ Johnson, Malcolm R. ..... Minneapolis
Johnson, Norman P. ..... Minneapolis
Johnson, Norman Paul ..... Minneapolis
§ Johnson, Norton T. ..... Minneapolis
§ Johnson, Paul E. ..... Minneapolis
§ Johnson, Reinald G. ..... Minneapolis
§ Johnson, Reuben A. ..... Minneapolis
§ Johnson, Richard S. ..... Minneapolis
§ Johnson, Robert E. ..... Minneapolis
Johnson, Roger S. ..... Wayzata
Johnson, Ronald G. ..... Minneapolis
Johnson, Youbert T. ..... Minneapolis
Jones, David G. ..... Minneapolis
†§ Jones, Herbert W., Jr. ..... Minneapolis
§ Jones, Richard H. ..... Minneapolis
§ Jones, William R. ..... Minneapolis
Jordon, Donald V. ..... Minneapolis
Josewich, Alexander ..... Minneapolis
§ Judd, Allen S. ..... Minneapolis
§ Judd, Walter H. ..... Washington, D. C.
§ Jurdy, Mitchell J. ..... Minneapolis
§ Kadesky, Harold B. ..... Minneapolis
§ Kalin, Oscar T. ..... Minneapolis
§ Kallestad, Leonard L. ..... Wayzata
§ Kantar, Bruce L. ..... Minneapolis
§ Kaplan, Harold A. ..... Minneapolis
§ Kaplan, J. Jacob ..... Minneapolis
§ Karleen, Conrad I. ..... Minneapolis
§ Karlen, Markle ..... Minneapolis
Kasper, Robert E. ..... Minneapolis
Kaufman, Herschel J. ..... Minneapolis
§ Kelby, Gjert M. ..... Minneapolis
§ Kelly, Charles F. ..... Minneapolis
§ Kelly, John P. ..... Minneapolis
Kelly, John T. ..... Minneapolis
Kennedy, Byrl J. ..... Minneapolis
† Kennedy, Claude C. ..... Minneapolis
† Kennedy, Jane F. ..... Minneapolis
§ Kerkhof, Arthur C. ..... Minneapolis
Kiesler, Frank, Jr. ..... Minneapolis
Kim, Mark K. ..... Minneapolis
§ Kimmel, George C. ..... Minneapolis
King, Frances W. ..... Oak Terrace
§ Kinsella, Thomas J. ..... Minneapolis
Kjenaas, Ervin A. ..... Hastings
§ Knapp, Miland E. ..... Minneapolis
†§ Knight, Ralph T. ..... Minneapolis
† Knight, Ray R. ..... Minneapolis
Knudsen, Helen L. ..... Minneapolis
§ Koenecke, Gerald M. ..... Minneapolis
Kogl, Richard C. ..... Minneapolis
Kohlhase, Robert E. ..... Minneapolis
† Koller, Hermann M. ..... Minneapolis
Koller, Louis R. ..... Minneapolis
Koller, Robert L. ..... Minneapolis
Korchik, John P. ..... Minneapolis
Kosiak, John ..... Minneapolis

Kottke, Frederic J. ..... Minneapolis
Koucky, Rudolph W. ..... Minneapolis
§ Kovack, Freeman D. ..... Minneapolis
Kozak, Michael J. ..... Minneapolis
Krafchuk, John D. ..... Minneapolis
§§ Krafft, Walter E. ..... Minneapolis
§§ Kremen, Arnold J. ..... Minneapolis
Krieser, Albert E. ..... Minneapolis
§ Kucera, Frank J. ..... Hopkins
† Kucera, William J. ..... Santa Barbara, Calif.
§§ Kump, Warren L. ..... Minneapolis
§§ Kusz, Clarence V. ..... Minneapolis

§ LaBree, John W. ..... St. Louis Park
Lagaard, Sheldon M. ..... Minneapolis
† Lejoie, John M. ..... Minneapolis
§ Lamb, H. Douglas ..... Minneapolis
§ Lang, Leonard A. ..... Minneapolis
†§ Lapierre, Arthur P. ..... Minneapolis
§ Larsen, Frank W. ..... Minneapolis
§ Larson, Arthur K. ..... Minneapolis
§§ Larson, Clarence M. ..... Minneapolis
§§ Larson, Donald M. ..... Minneapolis
§§ Larson, Lawrence M. ..... Minneapolis
Larson, Leonard M. ..... Oak Terrace
Larson, Loren J. ..... Minneapolis
§ Larson, Paul N. ..... Minneapolis
Larson, Roger C. ..... Minneapolis
Latts, Elliot M. ..... Minneapolis
† LaVake, Rae T. ..... Minneapolis
Lawson, Warren R. ..... Minneapolis
Laymon, Carl W. ..... Minneapolis
§ Leavenworth, Richard O., Jr. ..... Minneapolis
Leemhuis, Andrew J. ..... Minneapolis
Leiferman, Robert J. ..... Minneapolis
Leinonen, Wendla E. ..... Anoka
§ Leland, Harold R. ..... Minneapolis
Lenz, Oa ..... Minneapolis
§§ Leonard, Lawrence J. ..... Minneapolis
Leonard, Samuel ..... Minneapolis
Lerner, A. Ross ..... Minneapolis
§ Lester, Richard G. ..... Minneapolis
Lienke, Roger I. ..... Robbinsdale
Lillehei, C. Walton ..... Minneapolis
Lillehei, Elmer J. ..... Robbinsdale
‡ Lind, Carl J., Jr. ..... Fort McPhearson, Ga.
Lindberg, Arthur N. ..... Minneapolis
† Lindberg, Arvid C. ..... Minneapolis
Lindberg, Vernon L. ..... Minneapolis
§§ Lindberg, Winston R. ..... Minneapolis
Lindblom, Maurice L. ..... Minneapolis
Lindemann, Charles E. ..... Minneapolis
Linderholm, Bruce E. ..... Minneapolis
Lindgren, Russell C. ..... Minneapolis
Lindquist, Richard H. ..... Minneapolis
§ Linner, Gunnar ..... Minneapolis
†§ Linner, Henry P. ..... Minneapolis
§ Linner, John H. ..... Minneapolis
§ Linner, Paul W. ..... Minneapolis
Lippman, Emanuel S. ..... Minneapolis
§ Lipschultz, Oscar ..... Minneapolis
† Litchfield, John T. ..... Minneapolis
Litman, Abraham B. ..... Minneapolis
Lober, Paul H. ..... Minneapolis
§ Lofsness, Stanley V. ..... St. Paul
†§ Logefeil, Rudolph C. ..... Minneapolis
Logothetis, John A. ..... Minneapolis
† Loomis, Earl A. ..... Hopkins
§ Lott, Frederick H. ..... Minneapolis
Lovett, Beatrice R. ..... Oak Terrace
Lowry, Elizabeth C. ..... Minneapolis
§ Lowry, Paul T. ..... Minneapolis
Lowry, Thomas ..... Minneapolis
Lueck, Wallace W. ..... Minneapolis
§ Lufkin, Nathaniel H. ..... Minneapolis
Lund, George W. ..... Minneapolis
Lundberg, Ruth I. ..... Minneapolis
Lundblad, Roy A. ..... Minneapolis
Lundblad, Stanley W. ..... Minneapolis
§§ Lundeberg, Karl R. ..... Minneapolis
§§ Lundquist, Virgil J. P. ..... Minneapolis
† Lynch, Matthew J. ..... Minneapolis
§§ Lyon, John D., Jr. ..... Hopkins
§§ Lyons, James H. ..... Minneapolis
Lyons, Michael W. ..... Minneapolis
†§ Lysne, Henry ..... Minneapolis
§ Lysne, Myron ..... Minneapolis
§§ Lyzenga, Anton G. ..... Minneapolis

McCaffrey, F. John ..... Minneapolis
§ McCampbell, Malcolm D. ..... Minneapolis
§ McCannel, Malcolm A. ..... Minneapolis
McCarthy, Donald ..... St. Paul
* McCartney, James S. ..... Minneapolis
§ McCormick, Donald P. ..... Minneapolis
† McDaniel, Orianna ..... Minneapolis
§§ McFarland, Arthur H. ..... Minneapolis
§§ McGandy, Robert F. ..... Minneapolis
§§ McGeary, George E. ..... Minneapolis
§§ McInerny, Maurice W. ..... Minneapolis
McKelvey, John L. ..... Minneapolis
§§ McKenzie, Charles H. ..... Minneapolis
§§ McKinlay, Chauncey A. ..... Minneapolis
§§ McKinlay, Gordon L. ..... Minneapolis
McKinney, Frank S. ..... Minneapolis
§§ McLaughlin, Byron H. ..... Minneapolis
§§ McMurtrie, William B. ..... Minneapolis
McNeil, John J. ..... Minneapolis
McParland, Felix A., Jr. ..... Minneapolis
§§ McPheeters, Herman O. ..... Minneapolis
†§ MacDonald, Daniel A. ..... Minneapolis
§§ MacDonald, John W. ..... Minneapolis
§§ MacKinnon, Donald C. ..... Minneapolis
§§ Mach, Frank B. ..... Minneapolis
Macheledt, Neil L. ..... Anoka
§§ Meader, Edward C. ..... Minneapolis
Magraw, Richard M. ..... Minneapolis
Mahle, James P. ..... Minneapolis
†§ Maland, Clarence O. ..... Minneapolis
§ Mandel, Sheldon L. ..... Minneapolis
§§ Mankey, James C. ..... Minneapolis
Mann, George A. ..... Minneapolis
MarCia, Alfred M. ..... Minneapolis
‡ Margulis, Alexander R. ..... Fort Bragg, N. C.
Mark, Aaron L. ..... Minneapolis
§§ Marking, George H. ..... Minneapolis
Martin, Frank E. ..... Minneapolis
§ Martin, George R. ..... Minneapolis
Martinson, Carl J. ..... Wayzata
§§ Martinson, Elmer J. ..... Wayzata
Mattson, Hamlin A. N. ..... Minneapolis
Maunder, John B ..... Minneapolis
†§ Maxeiner, Stanley R. ..... Minneapolis
Maxeiner, Stanley R., Jr. ..... Minneapolis
Mayberg, Donald M. ..... Minneapolis
§§ Meller, Robert L. ..... Minneapolis
§§ Merkert, Charles E. ..... Minneapolis
§§ Mergert, George L. ..... Minneapolis
§§ Merner, Thomas B. ..... Minneapolis
† Merrick, Charlotte T. ..... St. Paul
Messenheimer, Myron G. ..... Minneapolis
§ Meyer, Alvin J. ..... Minneapolis
† Meyer, E. Lawrence ..... Minneapolis
Meyer, Robert J. ..... Minneapolis
§§ Michael, Joseph C. ..... Minneapolis
§ Michel, Henry H. ..... Minneapolis
§ Michelson, Henry E. ..... Minneapolis
† Mickelsen, Emma F. ..... Minneapolis
Miller, Arden L. ..... Minneapolis
§§ Miller, Fletcher A. ..... Minneapolis
Miller, Harold D. ..... Minneapolis
§§ Miller, Harold E. ..... Minneapolis
§§ Miller, Hugo E. ..... Minneapolis
Miller, J. Carleton ..... Minneapolis
§§ Millett, D. Keith ..... Minneapolis
§§ Milton, John S. ..... Minneapolis
Minder, John G. ..... Mound
Minsky, Armen A. ..... Minneapolis
§§ Mitby, Irvin L. ..... Minneapolis
§§ Mitchell, Berton D. ..... Minneapolis
Mitchell, Edward C. ..... Minneapolis
§§ Mitchell, Mancel T. ..... Minneapolis
§§ Mixer, Harry W. ..... Minneapolis
§§ Moe, John H. ..... Minneapolis
Moe, W. Wyatt ..... Minneapolis
§ Moehn, John T. ..... Minneapolis
Moen, Johannes K. ..... Minneapolis
† Monahan, Elizabeth S. ..... Minneapolis
§ Monson, Einer M. ..... Minneapolis
Moore, Irvin H. ..... Minneapolis
Moorhead, Marie ..... Minneapolis
§ Moos, Daniel J. ..... Minneapolis
Moran, Leo J. ..... New Brighton
§§ Mork, A. Harold ..... Anoka
Mork, Frank E. ..... Anoka
Morrell, Frank ..... Minneapolis
Morrison, Charlotte J. ..... Minneapolis
§§ Mosser, Donn G. ..... Minneapolis
§§ Moyer, Leonard B. ..... Minneapolis
§§ Mulholland, William M. ..... Minneapolis
§§ Murphy, Edmund P. ..... Minneapolis
§§ Murray, Elisabeth M. ..... Minneapolis
Muske, Marvin M. ..... Minneapolis
§§ Musty, Nicholas J. ..... Minneapolis
§§ Myers, Jay A. ..... Minneapolis
§§ Myhre, James ..... Minneapolis

Nagobads, Visvaldis J. ..... Minneapolis
Nash, Eldore B. ..... Minneapolis
§§ Naslund, Ames W. ..... Minneapolis
Nauth, Bernard S. ..... Minneapolis
§ Neal, Joe M. ..... Minneapolis
Neary, Richard P. ..... Minneapolis
Nelson, C. Barton ..... Minneapolis
Nelson, Carleton A. ..... Minneapolis
§§ Nelson, Edward N. ..... Minneapolis
Nelson, Erland R. ..... Minneapolis
Nelson, Gunard R. ..... Minneapolis
§§ Nelson, Harvey ..... Minneapolis
§§ Nelson, Lloyd S. ..... Minneapolis
Nelson, Maxine O. ..... Minneapolis
§§ Nelson, Maynard C. ..... Minneapolis
§§ Nelson, O. L. Norman ..... Minneapolis
§§ Nelson, Wallace I. ..... Minneapolis
† Nerenberg, Sidney ..... Minneapolis
§§ Nesset, Lawren B. ..... Minneapolis
§§ Nesset, William D. ..... Minneapolis
Neumann, Roland F., Jr. ..... Minneapolis
§ Neumeister, Charles A. ..... Minneapolis
§§ Nolan, Robert K. ..... Minneapolis
§§ Noran, Axel S. N. ..... Minneapolis
§§ Noran, Harold H. ..... Minneapolis
§§ Nord, Robert E. ..... Minneapolis
† Nordin, Gustaf T. ..... Saratoga, California
§§ Nordland, Martin ..... Minneapolis
§§ Nordland, Martin A. ..... Minneapolis
§§ Norman, Mark L., Jr. ..... Minneapolis
§§ Norval, Mildred A. ..... St. Paul
Nuessle, William F. ..... Minneapolis
§§ Nydahl, Malvin J ..... Minneapolis
§§ Nylander, Emil G. ..... Minneapolis

§§ O'Brien, William A. ..... Minneapolis
† O'Donnell, James E. ..... Minneapolis
O'Hanlon, John A. ..... Minneapolis
§§ O'Phelan, E. Harvey ..... Minneapolis
Olavs, Olga ..... Minneapolis
§§ Olfelt, Paul C. ..... Minneapolis
§§ Olsen, E. George ..... Minneapolis
§§ Olsen, Jay R. ..... Minneapolis
§§ Olson, Alton C. ..... Minneapolis
§§ Olson, Carl J. ..... Minneapolis
§§ Olson, C. Kent ..... Minneapolis
§§ Olson, Detlof M. ..... Minneapolis
† Olson, Olaf A. ..... Minneapolis
§§ Olson, Philip A. ..... Minneapolis
§§ Olson, Rolland A. ..... Wayzata
Oppen, E. Gerhard ..... Minneapolis
§§ Oppen, Melvin G. ..... Wayzata
Opstad, Earl T. ..... Minneapolis
§§ Ott, Eugene C. ..... Minneapolis
Owen, Richard R ..... Minneapolis

Paal, Dwain J. ..... Minneapolis
Page, Raymond L. ..... Minneapolis
§§ Palen, Benjamin J. ..... Minneapolis
Palmer, Gerald K. ..... Minneapolis
Papermaster, Theodore C. ..... Minneapolis
Park, Wilford E. ..... Minneapolis
§§ Pattee, James J. ..... Minneapolis
§§ Peluso, Charles R. ..... Minneapolis
†§§ Peppard, Thomas A. ..... Minneapolis
§§ Perlman, Everett C. ..... Minneapolis
Perlman, Herschel L. ..... Minneapolis
§§ Peteler, Jennings C. L. ..... Minneapolis
Petersen, Byron D. ..... Minneapolis
§§ Petersen, Deane A. ..... Minneapolis
§§ Petersen, Glenn L. ..... Minneapolis
Petersen, Peter C. ..... Minneapolis
§ Petersen, William E. ..... Minneapolis
§§ Peterson, Henry ..... Minneapolis
§§ Peterson, Herbert W. ..... Minneapolis
§§ Peterson, Nordahl P. ..... Minneapolis
Peterson, Oliver H. ..... Minneapolis
Peterson, Oliver H., Jr. ..... Minneapolis
§ Peterson, Palmer A. ..... Minneapolis
†§ Peterson, Peter E. ..... Minneapolis
§ Peterson, Willard C. ..... Minneapolis
Petit, Julien V. ..... Minneapolis
†§ Petit, Leon J ..... Minneapolis
§§ Pewters, John T. ..... Minneapolis
§§ Peyton, William T. ..... Minneapolis
† Phelps, Kenneth A. ..... Menlo Park, Calif.
Pincus, Mitchell ..... Minneapolis
§§ Plasha, Matthew ..... Anoka
§§ Plass, Herbert F. R. ..... Minneapolis
§§ Plimpton, Nathan C. ..... Minneapolis
Pohl, John F. ..... Minneapolis
§§ Pollak, Kurt ..... Minneapolis
§§ Pollock, Anthony J. ..... Minneapolis
†§§ Pollock, David K. ..... Minneapolis
§§ Polzak, Jacob A. ..... Minneapolis
Popadiuk, Peter ..... Minneapolis
† Poppe, Frederick H. ..... Coral Gables, Fla.
§§ Potter, Robert B. ..... Minneapolis
§§ Pratt, Fred J., Jr. ..... Minneapolis
† Pratt, Fred J., Sr. ..... Minneapolis
† Preine, Irving A. ..... Osseo
§§ Prem, Konald A. ..... Minneapolis
† Preston, Paul J. ..... Minneapolis
§§ Price, William E. ..... Minneapolis
§§ Priest, Robert E. ..... Minneapolis
†§§ Prim, Joseph A. ..... Minneapolis
§§ Proffitt, William E. ..... Minneapolis

§§ Quello, Robert O. ..... Minneapolis
Quiggle, Arthur B. ..... Minneapolis
§§ Quist, Henry W., Jr. ..... Minneapolis

Raaen, Olaf ..... Minneapolis
§§ Racer, Harley J. ..... Minneapolis
§§ Raile, Richard B. ..... Minneapolis
§§ Ransom, H. Robert ..... Osseo
§§ Ratelle, Alexander H. ..... Minneapolis
Reed, Sheldon C. ..... Minneapolis
Regan, John J. ..... Minneapolis
§§ Regnier, Edward A. ..... Minneapolis
§§ Reif, Harold A. ..... Minneapolis
§§ Reiley, Richard E. ..... Minneapolis
§§ Reiser, Milton P. ..... Minneapolis
§§ Remole, William D. ..... Minneapolis
§§ Resch, Joseph A. ..... Minneapolis
§§ Reynolds, Donald P. ..... Minneapolis
§§ Rholl, Arnold O. ..... Minneapolis
§§ Rice, Carl O. ..... Minneapolis
Rice, Frank B. ..... Minneapolis

Rice, Fred A. ..... Minneapolis
§ Richdorf, Lawrence F. ..... Minneapolis
§ Rieke, Wellington W. ..... Wayzata
Riordan, Elsie M. ..... Minneapolis
§ Risch, Ronald E. ..... Minneapolis
§ Rizer, Dean K. ..... Minneapolis
† Rizer, Robert I. ..... Wayzata
Robb, Edwin F. ..... Minneapolis
§ Robbins, Owen F. ..... Minneapolis
Roberts, Byron H. ..... Minneapolis
§ Roberts, Lewis J. ..... Minneapolis
§ Roberts, Stanley W. ..... Minneapolis
Robinson, Cortland O. ..... Minneapolis
§ Rock, William H. ..... Anoka
§ Rocknem, Robert E. ..... Minneapolis
Rockwell, Curtiss V. ..... Minneapolis
† Rodda, Frederick C. ..... Minneapolis
§ Rodgers, Richard S. ..... Minneapolis
§ Rogin, Norton ..... Minneapolis
Rollins, Pat ..... Wayzata
§ Romness, Kenneth B. ..... Mound
Rosenbaum, David L. ..... Minneapolis
§ Rosendahl, Frederick G. ..... Minneapolis
Rosenfield, Abraham B. ..... Minneapolis
§ Rosenow, John H. ..... Minneapolis
† Rosenwald, Reuben M. ..... Coon Rapids
§ Ross, Alexander J. ..... Minneapolis
§ Rossen, Ralph ..... Minneapolis
Rotenberg, Robert J. ..... Minneapolis
§ Rothnem, Morris S. ..... Minneapolis
Rucker, William H. ..... Minneapolis
Rud, Norman E. ..... Minneapolis
† Rudell, Gustave L. ..... Minneapolis
Runquist, Richard K. ..... Anoka
§ Russeth, Arthur N. ..... Minneapolis
§ Rusten, Elmer M. ..... Minneapolis
Rydburg, Wayne C. ..... Minneapolis
§ Rydland, Arne D. ..... Minneapolis
§ St. Cyr, Harry M. ..... Robbinsdale
St. Cyr, Kenneth J. ..... Robbinsdale
§ Sadler, William P. ..... Minneapolis
§ Safirescu, Sorin R. ..... San Francisco, Calif.
§ Saliterman, Bernard I. ..... Minneapolis
§ Sandt, Karl E. ..... Minneapolis
Sawatzky, William A. ..... Minneapolis
§ Sborov, Abe M. ..... Minneapolis
Scallen, Raymond W. ..... Minneapolis
§ Schaaf, Frederick H. K. ..... Minneapolis
Schaar, Frances E. ..... Minneapolis
Schaefer, Kenneth F. ..... Minneapolis
Schaefer, Wesley G. ..... Minneapolis
§ Schafer, Thomas L. ..... Minneapolis
Schaffhausen, Irwin F. ..... Minneapolis
Schaffhausen, Mildred ..... Minneapolis
† Scheldrup, N. H. ..... Minneapolis
§ Scherer, L. Raymond ..... Minneapolis
Scherling, Sidney S. ..... Minneapolis
§ Schiele, Burtrum C. ..... Minneapolis
§ Schissel, Gregory A. ..... Minneapolis
§ Schmidt, W. Robert ..... Minneapolis
† Schmitt, S. C. ..... Los Angeles, Calif.
Schneck, Jack I. ..... Minneapolis
§ Schottler, Max E. ..... Minneapolis
§ Schroeder, Albert J. ..... Minneapolis
§ Schultz, Alvin L. ..... Minneapolis
Schultz, Earl A. ..... Minneapolis
§ Schultz, J. Harold ..... Minneapolis
§ Schultz, Peter J. ..... Minneapolis
§ Schulze, William M. ..... Minneapolis
§ Schumacher, John W. ..... Minneapolis
§ Schwartz, E. Robert ..... Minneapolis
§ Schwartz, Virgil J. ..... Minneapolis
† Scott, Horace G. ..... Minneapolis
† Seaberg, John A. ..... Pequot Lakes, Minn.
§ Segal, Martin A. ..... Minneapolis
† Seham, Max ..... Minneapolis
§ Seifert, Milton H. ..... Excelsior
Selck, Wolfgang ..... Fergus Falls
§ Semsch, Robert D. ..... Minneapolis
§ Shandorf, James F. ..... Minneapolis
Shaperman, Eva P. ..... Minneapolis
§ Shapiro, Irving ..... Minneapolis
§ Shapiro, Sidney K. ..... Minneapolis
§ Sharp, David V. ..... Minneapolis
§ Shaw, Howard A. ..... Minneapolis
§ Shea, Andrew W. ..... Minneapolis
Sheeley, William F. ..... Minneapolis
§ Sher, Lewis ..... Minneapolis
§ Sherman, Lloyd F. ..... Minneapolis
§ Sherman, Morris H ..... Minneapolis
Shillington, Maurice A. ..... Fort Lauderdale, Fla.
Shragg, Robert I. ..... Minneapolis
§ Shronts, John F. ..... Minneapolis
§ Sidell, Franklin D. ..... Minneapolis
§ Siegmann, William C. ..... Minneapolis
§ Silas, Ralph M. ..... Minneapolis
Silver, John D. ..... Minneapolis
† Simons, Jalmar ..... Aspen, Colorado
§ Simonson, Donald B. ..... Minneapolis
† Simpson, Ellery De W. ..... Asheville, N. C.
§ Sinykin, Melvin B. ..... Minneapolis
Sipe, James W. ..... Coon Rapids
Siperstein, David M. ..... Minneapolis
§ Skjold, Arthur C. ..... Minneapolis
Smiley, John T. ..... Minneapolis
§ Smisek, Frank M. ..... Minneapolis
Smith, Adam M. ..... Minneapolis
§ Smith, Archie M. ..... Minneapolis
§ Smith, Baxter A., Jr. ..... Minneapolis
§ Smith, Graham G. ..... Minneapolis
† Smith, Margaret I. ..... Gardena, Calif.
Smith, Nadine G. ..... Minneapolis
Smith, Norvin R. ..... Willmar
Smith, Ralph E. ..... Rochester
§ Smith, Theodore S. ..... Minneapolis
§ Smith, William T. ..... Minneapolis
§ Soderlind, Ragnar T. ..... Minneapolis
§ Solhaug, Samuel B. ..... Minneapolis
§ Solhaug, Samuel B., Jr. ..... Minneapolis
§ Solvason, Harold M. ..... Minneapolis
Spain, W. Thomas ..... Richmond, Va.
§ Spano, Joseph P. ..... Minneapolis
§ Spencer, Bernard J. ..... Minneapolis
§ Spink, Wesley W. ..... Minneapolis
§ Sponsel, Kenath H. ..... Minneapolis
† Spratt, Charles N. ..... Minneapolis
§ Stahr, Aubrey C. ..... Hopkins
§Stanford, Charles E. ..... Minneapolis
† Stanley, Court R. ..... Minneapolis
§ Staub, Henry P. ..... Minneapolis
§ Stelter, Lloyd A. ..... Minneapolis
§ Stennes, John L. ..... Minneapolis
† Stenstrom, Annette ..... Marine on the St. Croix
§ Stephens, William E. ..... Minneapolis
§ Sterrie, Norman A. ..... Minneapolis
§ Stewart, Marvin J. ..... Minneapolis
§ Stewart, Rolla I. ..... Minneapolis
§ Stiegler, Farrell S. ..... Minneapolis
Stoesser, Albert V. ..... Minneapolis
§ Stoltz, Robert C. ..... Minneapolis
† Stomel, Joseph ..... Los Angeles, Calif.
Stone, Norman F. ..... Minneapolis
Stone, Stanley P. ..... Minneapolis
§ Strickler, Jacob H. ..... Minneapolis
§ Strom, Gordon W. ..... Minneapolis
§ Stromgren, Delph T. ..... Minneapolis
§ Stromme, William B. ..... Minneapolis
Strunk, Clarence A. ..... Minneapolis
§ Sturges, Robert L. ..... Minneapolis
Subak, Barbara H. ..... Minneapolis
†§Subby, Walter, Jr. ..... Wayzata
Sukov, Marvin ..... Minneapolis
Sullivan, Raymond M. ..... Minneapolis
Swanson, Roy E. ..... Minneapolis
Swanson, Wallace L. ..... Minneapolis
§ Sweetser, Horatio B. ..... Minneapolis
§ Sweetser, Theodore H. ..... Minneapolis
§ Sweetser, Theodore H., Jr. ..... Minneapolis
† Sweitzer, Samuel E. ..... Minneapolis
†§Swendseen, Carl G. ..... Minneapolis
Syverton, Jerome T. ..... Minneapolis
§ Tam, Ernest C. ..... Minneapolis
§ Tangen, George M. ..... Minneapolis
Taylor, Joseph H. ..... Minneapolis
§ Taylor, William E. ..... Minneapolis
Teeter, Richard R. ..... Wauwatosa, Wis.
§ Tenner, Robert J. ..... Minneapolis
Thal, Alan P. ..... Minneapolis
Theobalt, Inge M. ..... Minneapolis
Thomes, A. Boyd ..... Minneapolis
Thompson, Arthur ..... Minneapolis
§ Thompson, Willis H. ..... Minneapolis
Thorsen, David S. ..... Minneapolis
§ Thorson, Stuart V. ..... Minneapolis
§ Thysell, Desmond M. ..... Minneapolis
§ Tinkham, Robert G. ..... Minneapolis
§ Titrud, Leonard A. ..... Minneapolis
Tobin, John D. ..... Minneapolis
Todd, Thomas N. F. ..... Minneapolis
Trach, Benedict B. ..... Minneapolis
§ Trow, James E. ..... Minneapolis
Trow, William H. ..... Minneapolis
Trueman, Harold S. ..... Minneapolis
Tsai, Shih Hao ..... Oak Terrace
§ Tucker, Richard C. ..... Minneapolis
§ Tudor, Richard B. ..... Minneapolis
†§Turnacliff, Dale D. ..... St. Paul
§ Twidwell, Joseph E. ..... Minneapolis
Twomey, John E. ..... Minneapolis
†§Ulrich, Henry L. ..... Minneapolis
§ Ulvestad, Harold S. ..... Minneapolis
†§Undine, Clyde A. ..... Minneapolis
§ Utendorfer, Robert W. ..... Minneapolis
Valgemae, Romil ..... Minneapolis
Veinbergs, Arnolds ..... Minneapolis
§ Vennes, Jack A. ..... Minneapolis
Vik, A. Elliott ..... Minneapolis
*§Vitols, T. M. ..... Minneapolis
Von Drashek, Stanley C. ..... Minneapolis
Wagner, Robert M. ..... Minneapolis
Wahlquist, Harold F. ..... Minneapolis
Waldron, Carl W. ..... Hopkins
§ Wall, Carl R. ..... Minneapolis
Wallace, Helen M. ..... Minneapolis
§ Walonick, Albert L. ..... St. Louis Park
§ Walsh, Francis M. ..... Minneapolis
§ Walsh, William T. ..... Minneapolis
§ Wangensteen, Owen H. ..... Minneapolis
Ward, Percy A. ..... Minneapolis
§ Watson, C. Gordon ..... Minneapolis
Watson, Cecil J. ..... Minneapolis
Wattenberg, Lee W. ..... Minneapolis
Weatherhead, Donald S. P. ..... Minneapolis
¶ Weaver, Myron Mc. ..... Schenectady, N. Y.
§ Webb, Edgar A. ..... Minneapolis
§ Webber, Richard J. ..... St. Louis Park
§ Weber, Lowell W. ..... Minneapolis
§ Weisberg, Rapheal J. ..... Minneapolis
§ Wendland, John P. ..... Minneapolis
Werner, George ..... Minneapolis
§ Wesolowski, Stanley P. ..... Minneapolis
† West, Catherine C. ..... Minneapolis
Wetherby, Macnider ..... Minneapolis
Wexler, Harold M. ..... Minneapolis
§ Wheeler, Robert W. ..... Minneapolis
Whitacre, John C., II ..... Minneapolis
§ White, Asher A. ..... Minneapolis
†§White, S. Marx ..... Minneapolis
§ White, Willard D. ..... Minneapolis
§ Whitesell, Lloyd A. ..... Minneapolis
§ Widen, Wilford F. ..... Minneapolis
Wild, John J. ..... Minneapolis
† Wilder, Kenneth W. ..... Minneapolis
† Wilder, Robert L. ..... Minneapolis
† Wilder, R. M., Jr. ..... Topeka, Kansas
§ Wilder, Walter L. ..... Minneapolis
§ Wilken, Paul A. ..... Minneapolis
Williams, Paul A. ..... Minneapolis
§ Williams, Richard E ..... Robbinsdale
† Williams, Robert ..... Unknown
§ Wilson, Robert E. ..... Minneapolis
Winchell, Paul ..... Minneapolis
Winther, Nora M. C. ..... Minneapolis
§ Wippermann, Frederic F. ..... Minneapolis
†§Witham, Carl A. ..... Minneapolis
†§Wittich, Frederick W. ..... Minneapolis
§ Wohlrabe, Arthur A. ..... Minneapolis
§ Wohlrabe, A. Cabot ..... Minneapolis
§ Wolf, Alfred H. ..... Minneapolis
Wolter, Frederick H. ..... Minneapolis
§ Wright, Thomas D. ..... Minneapolis
§ Wright, Wale S. ..... Minneapolis
§ Wright, William S. ..... Edina
§ Ylvisaker, Ragnvald S. ..... Minneapolis
†§Yoerg, Otto W. ..... Minneapolis
Yue, Wen Y. ..... Oak Terrace
Zahrendt, O. Lewis ..... Minneapolis
§ Zarling, V. Richard ..... Minneapolis
§ Zaworski, Leo A. ..... Minneapolis
Zierold, Arthur A. ..... Minneapolis
§ Zinter, Ferdinand A. ..... Minneapolis
†§Ziskin, Thomas ..... Minneapolis

KANDIYOHI-SWIFT-MEEKER COUNTY MEDICAL SOCIETY

Kandiyohi, Swift, and Meeker Counties

Regular meetings, third Thursday. Annual meeting third Thursday, November

Number of Members—54

President
MACKLIN, JR., W. E. ..... Willmar
Secretary
OPSAHL, LAWRENCE J. ..... Willmar
Allison, David D. ..... Litchfield
Anderson, Richard E. ..... Willmar
§ Bosland, Howard G. ..... Willmar
§ Bradley, Nelson J. ..... Willmar
§ Carlson, Donald L. ..... Willmar
Chunn, Stanley S. ..... Willmar
† Daignault, Oscar ..... Benson
† Danielson, Karl A. ..... Litchfield
Danielson, Lennox ..... Litchfield
Dille, Donald E. ..... Litchfield
§ Docksey, John W. ..... Willmar
Eberley, Tobe S. ..... Benson
§ Ellinger, Albert J. ..... Willmar
Fedor, Robert D. ..... Litchfield

§ Ford, F. Wendell ..... New London
Frederickson, Alice C. ..... Willmar
§ Gaebe, Milton B. ..... Clara City
Giere, Silas W. ..... Benson
§ Gilman, Lloyd C. ..... Willmar
Griffin, Richard P. ..... Benson
§ Guy, Jack H ..... New London
§ Helwig, Karl L., Jr. ..... Kerkhoven
*§Herbst, Richard F. ..... Willmar
§ Hinz, Walter E. ..... Willmar
†§Hodapp, Robert V. ..... Minneapolis
§ Holm, Donald F. ..... Benson
§ Houts, Joseph C. ..... Dassel
Jacobs, Douglas L. ..... Willmar
§†Jacobs, Johannes C. ..... Willmar
§ Johnson, Marvin W. ..... Dassel
§ Kaufman, Edward J. ..... Appleton
McCarthy, Austin M. ..... Willmar
Macklin, William E., Jr. ..... Willmar
§ Meinert, John K. ..... Willmar
§ Michels, Roger P. ..... Willmar
§ Nelson, Robert H. ..... Benson
† O'Connor, Daniel C. ..... Eden Valley
§ Olson, Gregory M. ..... Litchfield
§ Opsahl, Lawrence J. ..... Willmar
§ Peterson, Willard E. ..... Willmar
† Porter, Oliver M. ..... Minneapolis
§ Proeschel, Ray K. ..... Willmar
§ Rorem, Joseph A. ..... Appleton
§ Ruchie, Warren H. ..... Willmar
Rygh, Harold N. ..... Atwater
Schnell, Frederick S. ..... Litchfield
Skaife, William F. ..... Benson
†§Solsem, Frederick N. S. ..... Spicer
† Sutherland, W. H. ..... Denver, Colorado
Thompson, Russell A ..... Cosmos
Wagner, Norman W. ..... Benson
‡ Williams, Francis R. ..... Duluth
Wilmot, Cecil A. ..... Litchfield
Wilmot, Harold E. ..... Litchfield

LYON-LINCOLN COUNTY MEDICAL SOCIETY

Lyon and Lincoln Counties

Regular meetings, 6-week period in spring and fall. Annual meeting, fourth Tuesday in October

Number of Members—27

President
OLSON, ROBERT T. ..... Canby

Secretary
HEDENSTROM, PHILIP C. ..... Marshall

Casey, John J. ..... Ivanhoe
§ Eckdale, John E. ..... Marshall
§ Engwall, Richard ..... Ivanhoe
§ Ferguson, William C. ..... Walnut Grove
§ Ford, Burton C. ..... Marshall
† Gray, Frank D. ..... Marshall
§ Guldseth, Gustav J. ..... Hendricks
§ Hedenstrom, Philip C. ..... Marshall
§ Hermanson, Peter E. ..... Hendricks
† Hoidale, Andrew D. ..... Tracy
§ Johnson, C. Percy ..... Tyler
§ Kreuzer, Titus C. ..... Marshall
§ Larson, Milo H. ..... Lake Benton
§ Lee, Norman J. ..... Tracy
§ Monson, Leonard J. ..... Canby
§ Murphy, Joseph E. ..... Marshall
§ Myers, John W. ..... Canby
§ Olson, Robert T. ..... Canby
§ Peterson, Kenneth A. ..... Marshall
§ Remsberg, Robert R. ..... Tracy
§ Tainter, Ronald W. ..... Marshall
Thill, Leonard J. ..... Balaton
§ Thompson, Carl O. ..... Hendricks
§†Vadheim, Alfred L. ..... Tyler
§†Valentine, Walter H. ..... Tracy
§ Workman, Warner G. ..... Tracy
†§Yaeger, Wilbert W. ..... Marshall

McLEOD COUNTY MEDICAL SOCIETY

McLeod County

Regular meetings, third Thursday of each month. Annual meeting, third Thursday in December

Number of Members—21

President
HOWELL, MILTON M. ..... Glencoe

Secretary
TRUESDALE, CLARK W. ..... Glencoe

§ Bretzke, Carl O. ..... Hutchinson
§ Brink, Donald M. ..... Hutchinson
Carroll, John J. ..... Winsted
§ Chervenak, William A. ..... Winsted
§ Griebie, Grant L. ..... Brownton
Howell, Milton M. ..... Glencoe
Huebert, Dan W. ..... Hutchinson
Jensen, Alvin M. ..... Brownton
Lipsmann, Elmer W. ..... Hutchinson
§ McCoy, Donald ..... Glencoe
§ McNeil, Maurice A. ..... Glencoe
§ Navratil, Donald R. ..... Glencoe
§ Neumaier, Arthur A. ..... Glencoe
§ Peterson, Kenneth H. ..... Hutchinson
Sahr, Walter G. C. ..... Hutchinson
† Scholpp, Otto W. ..... Hutchinson
§ Selmo, Joseph D. ..... Norwood
Sheppard, Charles G. ..... Hutchinson
§ Smith, George R. ..... Hutchinson
Smyth, John J. ..... Lester Prairie
§ Truesdale, Clark W. ..... Glencoe

MOWER COUNTY MEDICAL SOCIETY

Mower County

Regular meetings, last Thursday of every month. Annual meeting, December

Number of Members—45

President
ANDERSON, WALLACE R. ..... Austin

Secretary
ROSENTHAL, F. HAROLD ..... Austin

§ Anderson, David P., Jr. ..... Austin
§ Anderson, Harold J. ..... Austin
Anderson, Wallace R. ..... Austin
§ Barber, Tracy E. ..... Austin
§ Cronwell, Bernhard J. ..... Austin
Elliott, Harold J. ..... Hayfield
§ Fetzek, Albert D. ..... Austin
§ Fisch, Herbert M. ..... Austin
§ Flanagan, Leonard G. ..... Austin
*†§Grise, William G. ..... Austin
§ Hagen, John D. ..... Austin
† Havens, John G. W. ..... Austin
† Hegge, Olav H. ..... Austin
† Hertel, Garfield E. ..... Austin
§ Hesla, Inman A. ..... Austin
§ Leck, Paul C. ..... Austin
§ Lommen, Peter A. ..... Austin
§ Lommen, Peter A., Jr. ..... Austin
† McKenna, Elizabeth M. ..... San Francisco, Calif.
† McKenna, Jay K. ..... Austin
† Melzer, George R. ..... Lyle
§ Miller, Herman ..... Austin
§ Morse, Morton P. ..... LeRoy
† Murray, Roger C. ..... Madison, Wis.
§ Nesse, James A. ..... Austin
§ Osborn, Donald O. ..... Austin
§ Paulus, Harold E. ..... Austin
§ Peterson, Stanley C. ..... Austin
§ Peterson, Willard H. ..... Austin
§ Roberts, George A. ..... Austin
§ Robertson, Paul A. ..... Austin
§ Rosenthal, F. Harold ..... Austin
§ Sargent, Edward C., Jr. ..... Austin
Schneider, Paul J. ..... Adams
§ Schwartz, Carl A. ..... Austin
§ Seery, Thomas M. ..... Austin
Sheedy, Chester L. ..... Austin
Shin, Rok ..... Grand Meadow
Smythe, Lowell ..... Austin
§ Stahl, George W. ..... Austin
§ Taufic, Mansur ..... Austin
§ Thomson, James M. ..... Austin
§ Twiggs, Leo F. ..... Austin
§ Van Cleve, Horatio P., Jr. ..... Austin
§ Wright, Robert R. ..... Austin

NICOLLET-LE SUEUR COUNTY MEDICAL SOCIETY

Nicollet and Le Sueur Counties

Regular meetings, first Monday of alternate months. Annual meeting, December

Number of Members—29

President
TRAXLER, J. F. ..... Henderson

Secretary
THOMPSON, A. H. ..... St. Peter

† Ager, Ernest A. ..... Minneapolis
† Branham, Donald S. ..... Deer Park, Wis.
§ Canfield, Wayne W. ..... St. Peter
§ Curtis, Rauen A. ..... Le Center
† Ericson, Swan ..... Los Angeles, Calif.
Gislason, Solvig T. ..... St. Peter
§ Gridley, John W. ..... Arlington
§ Grimes, Burton P. ..... St. Peter
§ Haes, Julius E. ..... St. Peter
* Henry, Martin R. ..... St. Peter
§ Hiniker, Peter J. ..... Le Sueur
Huffington, Herb L., Jr. ..... Waterville
† Kabrick, Ola A. ..... St. Peter
Kath, Reinhard H. ..... Arlington
§ Lenander, Mellvin E. L. ..... St. Peter
§ Limbeck, Donald A. ..... Le Sueur
Olmanson, Edmund G. ..... St. Peter
§ Olmanson, Myron D. ..... St. Peter
§ Olson, Duane O. ..... Gaylord
* Rudie, Clifford N. ..... St. Peter
§ Samuelson, L. Gordon ..... St. Peter
§ Schulberg, Verne A. ..... Gaylord
§ Sjostrom, Lawrence E. ..... St. Peter
§ Sonnesyn, Nels N. ..... Le Sueur
§ Strathern, Carleton S. ..... St. Peter
† Strathern, Fred P. ..... St. Peter
§ Thompson, A. Henry ..... St. Peter
Traxler, J. Felix ..... Henderson
§ Wohlrabe, Clarence F. ..... North Mankato

PARK REGION DISTRICT AND COUNTY MEDICAL SOCIETY

Douglas, Grant, Otter Tail, and Wilkin Counties
Regular meetings, March, June and September. Annual meeting, December
Number of Members—65

President
KORDA, HENRY ..... Pelican Rapids

Secretary
GEISER, PETER M. ..... Alexandria

Arndt, Harry W. ..... Detroit Lakes
Baker, Jeannette L. ..... Fergus Falls
Baker, Norman ..... Fergus Falls
§ Bateman, Clarence ..... Breckenridge
† Blakey, Adam R. ..... Osakis
§ Boline, Clifford A. ..... Battle Lake
§ Cain, James H. ..... Alexandria
Campbell, Dennis V. ..... Fergus Falls
§ Carlson, Carl E. ..... Alexandria
Carlson, Homer J. ..... Pelican Rapids
Clifford, George W. ..... Alexandria
§ Coleman, Edward L. ..... Fergus Falls
§ Daehlin, Rolf .. Fergus Falls
§ Doms, Vernon A. ..... Elbow Lake
§ Emerson, Edwin E. ..... Osakis
§ Estrem, Ralph L. ..... Fergus Falls
§ Estrem, Robert D. ..... Fergus Falls
§ Geiser, Peter M. ..... Alexandria
§ Hamlon, John S. ..... Fergus Falls
Hanson, Everett C. ..... New York Mills
† Hanson, LeRoy W. ..... Houston, Texas
§ Heegaard, William G. ..... Alexandria
†§ Heiberg, E. A. ..... Fergus Falls
§ Helseth, Hovald K. ..... Fergus Falls
§ Hom, Leong, Y. W. ..... Battle Lake
§ Hunt, William ..... Fergus Falls
§ Jacobson, Clifford W. ..... Breckenridge
Johnson, Ray A. ..... Fergus Falls
§ Kevern, Jay L. ..... Henning
§ Kippen, Neil ..... Breckenridge
§ Korda, Henry A. ..... Pelican Rapids
Larson, Donald M. ..... Minneapolis
Larson, Dorette W. ..... Fergus Falls
† Leibold, Herbert H. ..... Parkers Prairie
§ Lewis, Arthur J. ..... Henning
§ Lewis, Charles W. ..... Henning
Love, Frederick A. ..... Carlos
Lu, Cheng-en ..... Fergus Falls
§ Lund, Carl J. T. ..... Fergus Falls
May, Robert B. ..... Fergus Falls
† Mortenson, Nels G. ..... Minneapolis
§ Mouritsen, Glenn J. ..... Fergus Falls
§ Nelson, Roy A. ..... Fergus Falls
Nelson, Wilburn O. B. ..... Sanborn, Minn.
§ Ness, Richard A. ..... Fergus Falls
§ O'Brien, Louis R. ..... Breckenridge
Ostergaard, Erling ..... Evansville
Parson, E. Lillian B. ..... Elbow Lake
Parson, Lester R. ..... Elbow Lake
† Patterson, William L. ..... Fergus Falls
†§ Paulson, Theodore S. ..... Fergus Falls
Perkins, Douglass E. ..... Alexandria
Reinhardt, James H. ..... Alexandria
Rockwood, Philo H. ..... Fergus Falls
§ Sanderson, David J. ..... Fergus Falls
† Satersmoen, Theodore ..... Pelican Rapids
§ Sather, Edgar R. ..... Alexandria
Schamber, Walter F. ..... Parkers Prairie
Schoeneberger, P. B. ..... Perham
§ Sethre, Arthur E. ..... Fergus Falls
Shaver, Ward ..... Fergus Falls
Singbeil, J. H. ..... Breckenridge
§ Stemsrud, Harold ..... Alexandria
Syverson, L. A. ..... Fergus Falls
§ Tanquist, Edwin J. ..... Alexandria
Warner, James J. ..... Perham
§ Wasson, Loren F. ..... Alexandria

RAMSEY COUNTY MEDICAL SOCIETY

Ramsey County
Regular meetings, last Monday each month except, June, July, and August.
Annual meeting in January
Number of Members—512

President
KAMMAN, GORDON R. ..... St. Paul

Secretary
SKINNER, ABBOTT ..... St. Paul

Executive Secretary
OLSON, MRS. ELEANOR ..... St. Paul

Abrams, Alexander, Jr. ..... St. Paul
§ Adair, Albert F., Jr. ..... St. Paul
Adams, Harold R. ..... St. Paul
† Ahrens, Albert E. ..... St. Paul
§ Ahrens, Robert M. ..... St. Paul
§ Alden, John F., Jr. ..... St. Paul
Ambrus, Laszlo ..... St. Paul
§ Amerongen, W. W. ..... St. Paul
§ Arnquist, Andrew S. ..... St. Paul
§ Arny, Frederick P. ..... St. Paul
§ Arzt, Philip K. ..... St. Paul
§ Aurelius, J. Richards ..... St. Paul
§ Ausman, Duane R. ..... St. Paul
Austrian, Sol ..... St. Paul
Babb, Frank S. ..... St. Paul
§ Baer, Walter ..... St. Paul
§ Baird, Raymond L. ..... St. Paul
Balcome, Milton M. ..... St. Paul
Barnett, Joseph M. ..... St. Paul
† Barsness, Nellie O. N. ..... St. Paul
Bauer, Eugene L. ..... St. Paul
†§ Beals, Hugh ..... La Jolla, California
§ Beck, Charles J. ..... North St. Paul
§ Beech, Raymond H. ..... St. Paul
§ Beek, Harvey O. ..... St. Paul
§ Beer, John J. ..... St. Paul
§ Bell, C. Curry ..... St. Paul
§ Bellomo, James ..... St. Paul
§ Benepe, James L. ..... St. Paul
Benthack, Elaine M. ..... St. Paul
Bernhisel, Harris G. ..... St. Paul
Bernier, M. J. ..... North St. Paul
§ Bernstein, William C. ..... St. Paul
§ Bicek, Joseph F. ..... St. Paul
† Binger, Henry E. ..... Phoenix, Ariz.
Bjornson, Robert G. B. ..... St. Paul
Black, Earl J. ..... St. Paul
Blackburn, Henry W., Jr. ..... St. Paul
§ Blomberg, William R. ..... St. Paul
Blumberg, Henry B. ..... St. Paul
†§ Bock, Rolland A. ..... St. Paul
§ Bonello, Frank J. ..... St. Paul
§ Borg, Joseph F. ..... St. Paul
† Bouma, Lewis R. ..... St. Paul
Bouthilet, Florence J. ..... St. Paul
* Brand, George D. ..... St. Paul
† Bray, Elwyn R. ..... St. Paul
§ Briggs, John F. ..... St. Paul
§ Broadie, Thomas E. ..... St. Paul
§ Brodie, Walter D. ..... St. Paul
Brown, Ian A. ..... St. Paul
Brown, James E., Jr. ..... St. Paul
† Brown, John C. ..... Los Gatos, California
§ Bulinski, Theodore J. ..... St. Paul
§ Burch, Edward P., II ..... St. Paul
§ Burklund, Edwin C. ..... St. Paul
§ Burlingame, David A. ..... St. Paul
§ Burmeister, Richard O. ..... St. Paul
† Burns, Robert M. ..... St. Paul
Burton, Carl G. ..... St. Paul
§ Bush, Robert P. ..... St. Paul
§ Busher, Herbert H. ..... St. Paul
§ Cain, Clark L. ..... St. Paul
Calin, Stanford H. ..... St. Paul
Callahan, Francis F. ..... St. Paul
Cameron, Dale C. ..... St. Paul
Canine, James L. ..... South St. Paul
§ Carley, Walter A. ..... St. Paul
Cederleaf, Cherry B. ..... Mahtomedi
Chadbourn, Charles R. ..... St. Paul
†§ Chatterton, Carl C. ..... St. Paul
§ Christiansen, Andrew ..... St. Paul
§ Clark, Henry B., Jr. ..... Minneapolis
§ Cochrane, Byron B. ..... St. Paul
Coddon, Walter D. ..... St. Paul
§ Cohen, Ellis N. ..... St. Paul
§ Colby, Woodard L. ..... St. Paul
Cole, Wallace H. ..... St. Paul
§ Coleman, John B. ..... St. Paul
† Collie, Henry G. ..... St. Petersburg, Fla.
§ Connolly, Coleman J. ..... St. Paul
Connolly, Joseph P. ..... South St. Paul
Connor, Charles E. ..... St. Paul
§ Cook, C. Kenneth ..... St. Paul
§ Cooper, Charles C. ..... St. Paul
‡ Coseriu, Vasile G. ..... Parma Hgts., Ohio
† Countryman, Roger S. ..... Saratoga, Calif.
§ Craig, David M. ..... St. Paul
Crowley, James H. ..... St. Paul
§ Crudo, Vincent D. ..... St. Paul
§ Crump, James W. ..... St. Paul
§ Culver, Lucian G. ..... St. Paul
§ Cumming, E. Dale ..... St. Paul
Dahl, Diane A. ..... Mahtomedi
§ Davis, Edward V. ..... St. Paul
Dawson, James R. ..... St. Paul
Decker, Charles H. ..... St. Paul
§ Derauf, Benjamin I. ..... St. Paul
§ Derauf, Donald E. ..... St. Paul
§ Deters, Donald C. ..... St. Paul
§ Drake, Carl B. ..... St. Paul
Dunn, Robert C. ..... St. Paul
Dyrdal, Paul J. ..... St. Paul
§ Earl, George A. ..... St. Paul
§ Earl, John R ..... St. Paul
Edwards, Joseph W. ..... St. Paul
Edwards, Lloyd G. ..... St. Paul
§ Edwards, Thomas J. ..... St. Paul
§ Eginton, Charles T. ..... St. Paul
Emerson, Edward C. ..... St. Paul
§ Emmons, Robert W. ..... St. Paul
§ Endress, Edward K. ..... St. Paul
Engels, Edward P. ..... Rice Lake, Wis.
§ Enroth, Oscar E. ..... St. Paul
† Ernest, George C. H. ..... Lakeland, Fla.
§ Ersfeld, Murray P. ..... St. Paul
† Eshelby, E. C. ..... St. Paul
Falk, Abraham ..... St. Paul
Farkas, John V. ..... St. Paul
§ Fee, John G. ..... St. Paul
§ Felder, Davitt A. ..... St. Paul
§ Felion, Arthur J. ..... St. Paul
§ Fesler, Harold H. ..... St. Paul
Field, Anthony H. ..... Farmington
§ Fink, Daniel L. ..... St. Paul
§ Fischer, Robert F. ..... St. Paul
§ Fisher, Dan W. ..... St. Paul
§ Flanagan, Harold F. ..... St. Paul
§ Flannery, Hubert F. ..... St. Paul
§ Flom, Reynold P. ..... St. Paul
§ Flynn, Louis L., Jr. ..... St. Paul
Flynn, Robert A. ..... St. Paul
† Fogarty, Charles W. ..... St. Paul
§ Fogarty, Charles W., Jr. ..... St. Paul
§ Fogelberg, Emil J. ..... St. Paul
§ Foley, Frederic E. B. ..... St. Paul
Forsythe, James R. ..... St. Paul
§ Fox, LeRoy J. ..... St. Paul
§ Freeman, Charles D., Jr. ..... St. Paul
§ Fritz, Wallace L. ..... St. Paul
§ Froats, Charles W. ..... St. Paul
§ Fuller, Benjamin F. ..... St. Paul
§ Galligan, John J. ..... St. Paul
§ Garbrecht, Arthur W. ..... St. Paul
§ Gardner, Walter P. ..... St. Paul
Garrow, Douglas M. ..... St. Paul
§ Gehlen, Joseph N. ..... St. Paul
Gibbs, Edward C. ..... St. Paul
§ Gillespie, Delmar R. ..... St. Paul
§ Gilsdorf, Donald A. ..... St. Paul
§ Gleason, Wallace A. ..... St. Paul
§ Goldsmith, Joseph W. ..... St. Paul
†§ Goltz, Edward V. ..... St. Paul
§ Grant, Hendrie W. ..... St. Paul
†§ Gratzek, Thomas ..... St. Paul
§ Grau, Robert K. ..... St. Paul
Gray, Edward F. ..... White Bear Lake
Guenther, Dean E. ..... W. St. Paul
Hagen, Paul S. ..... St. Paul
§ Hakanson, Erick Y. ..... St. Paul
§ Hall, Barnard ..... St. Paul
§ Hammes, Ernest M. ..... St. Paul
§ Hammes, Ernest M., Jr. ..... St. Paul
§ Hannon, Donald W. ..... St. Paul
† Harbaugh, John T. ..... Minneapolis
§ Harmon, Gaius E. ..... St. Paul
§ Hartfiel, William F. ..... St. Paul
Hartig, Marjorie ..... St. Paul
§ Hauser, Victor P. ..... St. Paul
§ Hayes, Albert F. ..... St. Paul
§ Heck, William W. ..... St. Paul
Hedenstrom, Frank G. ..... St. Paul
Hedlund, Charles J. ..... St. Paul
Heilig, William R. ..... St. Paul

Henderson, Arthur J. G. ....North St. Paul
§ Hengstler, William H. .....St. Paul
†*Hensel, Charles N. .....St. Paul
Herman, Samuel M. .....St. Paul
Herrmann, Edgar T. .....St. Paul
Hertz, Myron J. .....St. Paul
§ Hilger, Jerome A. .....St. Paul
Hilger, Laurence D. .....St. Paul
§ Hilker, Marcus D. .....St. Paul
Hiniker, Louis P. .....St. Paul
§ Ho, Shu Kang .....St. Paul
§ Hochfilzer, John J. .....St. Paul
Hodgson, Jane E. .....St. Paul
† Holcomb, O. William .....St. Paul
Hollinshead, William H. .....St. Paul
§ Holmen, Robert W. .....St. Paul
§ Holt, John E. .....St. Paul
Hopkins, G. Wendell .....St. Paul
Howard, Merrill A. .....St. Paul
§ Howe, Newell W. .....St. Paul
† Hoyt, Charles S. .....Rochester
§ Hullsiek, Harold E. .....St. Paul
§ Hunter, Murray H .....Farmington
§ Hunter, Samuel W. .....St. Paul
§ Hurwitz, Milton M. .....St. Paul
§ Husebye, Kjeld O. .....St. Paul

† Ide, Arthur W. .....Palm Beach, Fla.
Ikeda, Kano .....St. Paul

Jackson, William C. .....St. Paul
§ Jahnke, William R. .....St. Paul
§ James, Ellery M. .....St. Paul
§ James, John W. .....St. Paul
§ Janssen, Martin E. .....St. Paul
†§Jarvis, Bruce W. .....St. Paul
Jarvis, Charles W. .....St. Paul
Jarvis, Marilyn A .....St. Paul
§ Jastram, Rupert M. .....St. Paul
*†Jesion, Joseph W. .....Pine River
§ Johanson, Waldemar G. .....St. Paul
Johnson, Carl E. .....St. Paul
Johnson, Carolyn A. .....St. Paul
§ Johnson, Herbert W. .....St. Paul
Johnson, Morris B. .....St. Paul
§ Johnson, R. J. .....St. Paul
† Jones, E. Mendelssohn .....St. Paul
Joseph, Arnold H. .....St. Paul

§ Kamman, Gordon R. .....St. Paul
Kaplan, David H. .....St. Paul
Karon, Irvine M. .....St. Paul
§ Kasper, Eugene M. .....St. Paul
Katz, Louis J. .....Long Beach, Calif.
Keefe, Rolland E. .....St. Paul
§ Kelly, Albert C. .....St. Paul
§ Kelly, Edward H. .....St. Paul
§ Kelsey, Chauncey M. .....St. Paul
§ Kenefick, Emmett V. .....St. Paul
§ Kenyon, Thomas J. .....St. Paul
†§Kesting, Herman .....St. Paul
† King, George L. .....Hudson, Wis.
§ Knutson, Gerhard E. .....St. Paul
§ Knutson, Robert C. .....St. Paul
Kodres, Nina .....St. Paul
Koza, Donald W. .....St. Paul
§ Krezowski, Thomas K. .....St. Paul
§ Kugler, Alex A. .....St. Paul
§ Kuske, Albert W. .....St. Paul
§ Kusske, Bradley W. .....St. Paul
§ Kusske, Douglas R. .....St. Paul

§ Lannin, Bernard G. .....St. Paul
§ Lannin, Donald R. .....St. Paul
§ Larrabee, Walter F., Jr. .....St. Paul
Larson, Eva-Jane Ostergren .....St. Paul
Larson, James T. .....South St. Paul
Larson, Kenneth R. .....St. Paul
Larson, Martin L. .....St. Paul
§ Larson, Wyllis G. .....St. Paul
Laszewski, Franz von Zelberschwecht .....St. Paul
†§Leahy, Bartholomew .....St. Paul
§ Leick, Richard M. .....St. Paul
Leitch, Archibald .....St. Paul
§ Lepak, John A. .....St. Paul
Leven, N. Logan .....St. Paul
§ Leverenz, Carleton W. .....St. Paul
Levitt, George X. .....St. Paul
Lewis, Joyce S., Jr. .....St. Paul
§ Lick, Charles L. .....St. Paul
Lick, Louis C. .....St. Paul
§ Lick, William J., Jr. .....St. Paul
§ Lien, Richard J. .....St. Paul
† Lightbourn, Edgar L. .....Hastings
Lilleberg, Norbert J. .....St. Paul
§ Lindell, Robert E. .....St. Paul
Lippman, Hyman S. .....St. Paul
Litkewitsch, Helene .....St. Paul
§ Loken, Selmer M. .....South St. Paul
Lowe, Alexander D. .....South St. Paul
Lowe, Earl R. .....South St. Paul
Lowe, Thomas A. .....South St. Paul
§ Lundholm, Arthur M. .....Harris
§ Lynch, Francis W. .....St. Paul

§ McCabe, James S. .....St. Paul
§ McCain, Donovan L. .....St. Paul
McCarthy, Joseph J. .....St. Paul
† McClanahan, James H. ....White Bear Lake
McClanahan, Thomas S. ....White Bear Lake
McClellan, Robert J. .....St. Paul
McCloud, Charles N., Jr. .....St. Paul
McDaniel, Samuel P. .....Lakeville
§ McEwan, Alexander .....St. Paul
§ McGroarty, Brian J. .....St. Paul
McKenzie, Eva E. .....St. Paul
§ McNeill, J. A. .....St. Paul
MacCornack, Robert L., Jr. .....St. Paul
Maclean, Lloyd D. .....St. Paul
Mackoff, Sam M. .....Phoenix, Arizona
Madland, Robert S. .....St. Paul
§ Malerich, J. Anthony .....St. Paul
§ Malerich, J. Anthony, Jr. .....St. Paul
§ Manlove, Charles H., Jr. .....St. Paul
Marks, Roger W. .....St. Paul
§ Martin, Dwight L. .....St. Paul
†§Martineau, Joseph L. .....St. Paul
§ Mateo, Guillermo .....St. Paul
Matthews, James H. .....Minneapolis
§ Mazzitello, William F. .....St. Paul
§ Mears, Burtis J. .....St. Paul
§ Medelman, John P. .....St. Paul
§ Melancon, Joseph F. .....St. Paul
§ Menold, William F. .....St. Paul
Merrick, Robert L. .....St. Paul
*§†Meyerding, Edward A. .....St. Paul
§ Michienzi, Leonard J. .....St. Paul
Midboe, Gilbert .....Forest Lake
§ Miller, Albert G. .....St. Paul
Miller, William T. .....St. Paul
Miller, Zondal R. .....St. Paul
§ Milnar, Frank J. .....St. Paul
§ Mishek, Charles J. .....St. Paul
§ Moga, John A. .....St. Paul
Molander, Herbert A. .....St. Paul
Moller, Jurgen .....St. Paul
§ Monahan, Robert H. .....St. Paul
§ Mooney, Robert D. .....St. Paul
† Moquin, Marie A. .....St. Paul
† Moren, J. Adelaide .....White Bear Lake
Moriarty, M. Berenice .....St. Paul
Moriarty, Cecile R. .....St. Paul
§ Muller, A. Eugene .....North St. Paul
Mundahl, Harold R. .....St. Paul
§ Murphy, Jack T. .....St. Paul

§ Nash, Leo A. .....St. Paul
Neibergs, Lidija I. .....St. Paul
Neibergs, Pauls .....St. Paul
§ Nelson, Loren E. .....St. Paul
† Nelson, Louis A. .....St. Paul
§ Nelson, Louis A., Jr. .....St. Paul
Newberry, Truman A. .....St. Paul
Nimlos, Kenneth O. .....St. Paul
† Nimlos, Lenore O. .....St. Paul
§ Noble, John F. .....St. Paul
§ Noble, J. Lawrence .....St. Paul
§ Norman, David D. .....St. Paul
Nuebel, Charles J. .....St. Paul
Nye, Katherine A. .....St. Paul
Nye, Lillian L. .....St. Paul

§ O'Brien, J. C. .....St. Paul
O'Kane, Thomas W. .....St. Paul
§ O'Malley, Valentine .....St. Paul
§ O'Reilley, Bernard E. .....St. Paul
§ Ockuly, Orville E. .....St. Paul
† Ogden, Warner .....St. Paul
†§Ohage, Justus .....St. Paul
§ Olsen, Ralph L. .....St. Paul
* Olson, Charles A. .....St. Paul
§ Ostergren, Edward W. .....St. Paul
§ Ouellette, Alfred J. .....St. Paul
§ Owens, Frederick M., Jr. .....St. Paul

§ Palm, Neil M. .....St. Paul
Paulson, Elmer C. .....St. Paul
§ Paulson, Wallace J. .....St. Paul
Pearson, Fritz R. .....St. Paul
§ Pearson, Malcolm M. .....St. Paul
§ Peck, Willard R. .....St. Paul
Pedersen, Arthur H. .....St. Paul
Peterson, David B. .....St. Paul
§ Peterson, Donald H. .....St. Paul
Peterson, Edward A. .....St. Paul
§ Peterson, Harold O. .....St. Paul
Peterson, Joel L. E. .....St. Paul
Peterson, Roy L. .....White Bear Lake
Phillips, Leonard .....St. Paul
§ Plotke, Harry L. .....St. Paul
Polski, Paul G. .....South St. Paul
§ Post, Edmund A. .....St. Paul
Prentice, Walter B. .....St. Paul
§ Proud, Harry S. .....St. Paul
Quattlebaum, Frank W. .....St. Paul

Rabcevich, Anatole .....St. Paul
§ Ralph, James R. .....St. Paul
Ramlow, Ralph M. .....St. Paul
† Ramsey, Walter R. .....St. Paul
Rasmussen, Ramby C. .....St. Paul
§ Ravits, Harold G. .....St. Paul
§ Rea, Charles E. .....St. Paul
§ Reid, James W. .....South St. Paul
§ Reif, Robert W. .....White Bear Lake
Richards, Albert M. .....St. Paul
Richards, Ernest T. F. .....St. Paul
Richardson, Edward J., Jr. .....St. Paul
§ Richardson, Robert J. .....St. Paul
Rick, Paul F. W. .....St. Paul
Rinkey, Eugene .....St. Paul
Ripple, Rudolph J. .....St. Paul
§ Ritchie, Wallace P. .....St. Paul
§ Ritt, Albert E. .....St. Paul
§ Roach, Donald E. .....St. Paul
§ Robbins, Mason C. .....St. Paul
§ Rolig, David H. .....St. Paul
§ Rollie, Orris O. .....St. Paul
§ Rosenthal, Robert .....St. Paul
Rossing, Robert G. .....St. Paul
§ Roth, George C. .....St. Paul
†§Rothschild, Harold J. .....St. Paul
§ Rowe, Clarence J., Jr. .....St. Paul
§ Roy, Philemon C. .....St. Paul
† Ruhberg, George N. ....Santa Barbara, Calif.
§ Rukavina, John G. .....St. Paul
§ Rusterholz, Alan P. .....St. Paul
†Ryan, John J. .....St. Paul
§ Ryan, Joseph M. .....St. Paul

§ Sarnecki, M. M. .....St. Paul
† Satterlund, Victor L. ..New Richmond, Wis.
*†Savage, Francis J. .....St. Paul
§ Schmidtke, Reinhardt L. .....St. Paul
† Schoch, Robert B. J. .....St. Paul
§ Schons, Edward .....St. Paul
§ Schroeckenstein, Hugo F. .....St. Paul
†§Schuldt, Frederick C. .....St. Paul
† Schulze, Albert G. .....St. Paul
† Schwyzer, Hanns C. .....St. Paul
Schwyzer, Marguerite .....St. Paul
§ Scott, Eugene E. .....St. Paul
§ Sekhon, Mohan S. .....St. Paul
§ Sells, Richard J. .....North St. Paul
§ Setzer, Hobert J. .....St. Paul
§ Shannon, William R. .....St. Paul
§ Shelander, Marcus I. .....St. Paul
† Shellman, John J. ..Pacific Palisades, Calif.
* Short, Jacob .....St. Paul
§ Siegel, Clarence .....St. Paul
§ Simons, Leander T. .....St. Paul
§ Singer, Benjamin J. .....St. Paul
§ Skinner, Abbott .....St. Paul
† Skinner, Harvey O. .....St. Paul
† Skworcow, George .....Minneapolis
§ Smisek, Elmer A. .....St. Paul
§ Smith, Vernon D. E. .....St. Paul
§ Snyder, George William .....St. Paul
§ Sohlberg, Olof I. .....St. Paul
§ Sommerdorf, Vernon L. .....St. Paul
§ Sommers, Ben .....St. Paul
§ Sorem, Milton B. .....St. Paul
§ Soucheray, Philip H. .....St. Paul
§ Souster, Benjamin B. .....St. Paul
§ Sowada, Ernest J. .....St. Paul
§ Sperl, Michael P., Jr. .....St. Paul
§ Sprafka, Gregory .....St. Paul
§ Sprafka, Joseph L. .....St. Paul
§ Steinberg, Charles L. .....St. Paul
§ Sterner, Donald C. .....St. Paul
§ Sterner, Ernest R. .....St. Paul
§ Sterner, John J. .....St. Paul
† Stewart, Alexander .....St. Paul
§ Stolpestad, Armer H. .....St. Paul
§ Strand, Jack W. .....St. Paul
§ Strate, Gordon E. .....St. Paul
§ Straus, Maurice L. .....St. Paul
§ Strem, Edward L. .....St. Paul
§ Sturley, Rodney F. .....St. Paul
Sullivan, William A., Jr. .....Minneapolis
§ Swanson, John A. .....St. Paul
§ Swanson, Lawrence J. .....St. Paul
Swanson, Ralph H. .....St. Paul
Swendson, James J. .....St. Paul
Swenson, Donald B. .....St. Paul
Swenson, Paul C .....St. Paul

§ Tani, George .....St. Paul
§ Teisberg, John E .....St. Paul
Thompson, Flovd A. .....St. Paul
Thoreson, M. C. Bernice .....So. St. Paul
§ Tiffany, Francis B. .....St. Paul
§ Tifft, Cyril R. .....St. Paul
§ Tongen, Lyle A. .....St. Paul
Travis, James S. .....St. Paul
§ Tregilgas, Harold R. .....So. St. Paul
Tregilgas, Richard B. .....St. Paul

§ Ubel, Frank A. .....St. Paul
Van Bergen, Frederick H. .....Minneapolis
Varco, Richard L. .....St. Paul
§ Vaughn, C. Gordon .....St. Paul
Veirs, Dean M. .....St. Paul
Veirs, Ruby J. S. .....Elv
† Venables, Alexander E. .....St. Paul
Votel, Thomas W. .....St. Paul

§ Waas, Charles W. .....St. Paul
§ Walker, Arthur E. .....St. Paul
§ Wall, James O. .....St. Paul
§ Wallinga, Jack V. .....St. Paul

§ Walsh, Edward F. ..... St. Paul
§ Walter, Clarence W. ..... St. Paul
Warren, Cecil A. ..... St. Paul
Watson, P. Theodore ..... St. Paul
§ Watson, William H. A. ..... St. Paul
† Watson, William J. ..... Newport
Watz, Clarence E. ..... St. Paul
§ Webber, Fred L. ..... St. Paul
§ Wedes, Deno J. ..... St. Paul
§ Weis, Benjamin A. ..... St. Paul
§ Weisberg, Maurice ..... St. Paul
§ Wenzel, Gilbert P. ..... St. Paul
§§ Westover, Darrell E. ..... St. Paul
Wetteland, Thomas F. ..... West St. Paul
§ Wetzel, Earl V. ..... St. Paul
† Williams, Arthur B. ..... St. Paul
§ Williams, Clayton K. ..... St. Paul
§§ Williams, George E. ..... St. Paul
§§ Williams, John A. ..... St. Paul
Williams, Richard A. ..... St. Paul Park
§ Wilson, J. Allen ..... St. Paul
§ Wilson, James V. ..... St. Paul
† Winnick, Joseph B. ..... St. Paul
§§ Witthaus, Melvyn E. ..... St. Paul
Wolkoff, H. J. ..... St. Paul
Word, Harlan L. ..... St. Paul
Youngren, Everett R. ..... St. Paul
Zachman, Leo L. ..... St. Paul
Zagaria, James F. ..... St. Paul
§ Zimmermann, Bernard ..... St. Paul
†§ Zimmermann, Harry B. ..... St. Paul

RANGE MEDICAL SOCIETY

Koochiching, Itasca, and Northern Portion of St. Louis Counties
Regular Meetings, fourth Tuesday of the Month
Annual Meetings, January
Number of Members—113

President
ANTONOW, A. M. ..... Virginia

Secretary
JOHNSTON, H. WAYNE ..... Virginia

†§ Adams, Bertram S. ..... Hibbing
§ Addy, Edward R. ..... Gilbert
Ahola, Kenneth E. ..... Hibbing
§ Alpert, Abraham E. ..... Virginia
§ Anderson, Richard W. ..... Aurora
§ Antonow, Arthur M. ..... Virginia
§ Baich, Velemir M. ..... Coleraine
§ Barnes, Richard E. ..... Aurora
§ Benell, Otto E. ..... Virginia
† Binet, Henry E. ..... Grand Rapids
§ Blackmore, Sidney C. ..... Biwabik
§ Bolz, J. Arnold ..... Grand Rapids
§ Bonner, John L. ..... Eveleth
§ Bowen, Robert L. ..... Hibbing
§ Braun, Ohrmundt C. ..... Grand Rapids
§ Brockway, Roger W. ..... Grand Rapids
§ Byrne, William J. ..... Chisholm
§ Callan, Joseph A. ..... Virginia
§ Cantwell, William F. ..... International Falls
§ Chermak, Francis G. ..... International Falls
§ Chittum, John R. ..... Aurora
§ Ciriacy, Edward W. ..... Ely
§ Cope, Hershel B. ..... Virginia
§ DeMarais, Lloyd C. ..... Hibbing
§ Detjen, Edward D. ..... Bigfork
§ Dobler, Manfred G. ..... Ely
§ Eiseman, Walter ..... Hibbing
§ Erickson, George P. ..... Hibbing
§ Erickson, Vernon D. ..... Grand Rapids
†§ Erskine, Gordon M. ..... Grand Rapids
§ Evensta, John B. ..... Grand Rapids
§ Ewens, George B. ..... Virginia
§ Ferrell, Clarence R. ..... Grand Rapids
§ Flynn, Bernard F. ..... Hibbing
§ French, Bayard T. ..... Hibbing
§ Goodman, Charles E. ..... Virginia
†§ Graham, Archibald W. ..... Chisholm
§ Grahek, Jack P. ..... Ely
† Granquist, Richard D. ..... Minneapolis
§ Grinley, Andrew V. ..... Grand Rapids
§ Halper, Bernard ..... Hibbing
§ Halverson, Kermit J. ..... Chisholm
§ Hanover, Ralph D. ..... International Falls
§ Hansen, Robert E. ..... Hibbing
§ Heiam, Wm. C. ..... Cook
† Hill, John P. ..... Lima, Ohio
† Hoover, Norman W. ..... Rochester
§ Ireland, Gerald W. ..... Grand Rapids
§ Jacobson, Clarence ..... Chisholm
§ Joffe, Harold H. ..... Virginia
§ Johnsen, Henry A., Jr. ..... Edina
§ Johnson, Calvin J. ..... Grand Rapids
§ Johnsrud, Luverne W. ..... Hibbing
§ Johnston, H. Wayne ..... Virginia
§ Jolin, Francis M. ..... Grand Rapids
§ Karges, Laurel E. ..... Grand Rapids
§ Karish, Louis J. ..... Coleraine
§ Kelly, Robert T. ..... Grand Rapids
§ Knutson, Kenneth R. ..... Hibbing
§ Kotchevar, Frank R. ..... Eveleth
§ Kruger, Elmer L. ..... Nashwauk
§ Kundel, Robert Ray ..... Ely
§ Law, Harrison E. ..... Virginia
§ McGill, Leon K. ..... Virginia
§ McKenna, John J. ..... Virginia
§ McKenna, Maurice J. ..... Grand Rapids
§ MacDonald, Roger A. ..... Little Folk
§ Malmstrom, John A. ..... Virginia
§ Mast, Fredric L. ..... Chisholm
§ Miettunen, John B. ..... Hibbing
§ Moller, Theodore P. ..... Soudan
§ Morsman, L. Wm. ..... Hibbing
§ Muller, John J. ..... Hibbing
§ Murray, Robert A. ..... Hibbing
§ Nakamura, James Y. ..... Deer River
§ Neff, Walter S. ..... Virginia
§ Nelimark, Donald R. ..... Virginia
§ Nollet, Donald J. ..... Hibbing
§ Nyhus, Ralph E. ..... Hibbing
§ Owens, Ben P. ..... Hibbing
§ Paciotti, Vincent J. ..... Hibbing
§ Parker, Wilbert H. ..... Chisholm
§ Payne, Richard E. ..... Virginia
† Pearsall, Robert P. ..... Virginia
§ Peterson, Edward N. ..... Virginia
§ Pierce, Jack R. ..... Williamson, W. Va.
§ Prlina, Isaac M. ..... Virginia
§ Raattama, John W. ..... Nashwauk
§ Rajala, Arnold I. ..... Grand Rapids
§ Reed, Paul ..... Virginia
§ Richter, David J. ..... Virginia
§ Rowles, Everett K. ..... Coleraine
§ Salter, Reginald A. ..... Virginia
§ Schirber, Martin J. ..... Grand Rapids
§ Schweiger, Theodore R. ..... Hibbing
§ Sekanina, Jan ..... Babbitt
§ Sher, David A ..... Virginia
§ Siegel, John S. ..... Virginia
§ Sinamark, Andrew ..... Hibbing
§ Sisler, Clifford E. ..... Minneapolis
§ Snyker, Omer E. ..... Ely
§ Stolen, Keith H. ..... Grand Rapids
† Strathern, Moses L. ..... Gilbert
§ Student, Richard E. ..... Eveleth
§ Summar, M. Thomas ..... Virginia
§ Sutherland, Harry N. ..... Ely
§ Swenson, Richard W. ..... Hibbing
§ Thouin, Lawrence G. ..... Hibbing
§ Walter, Frederick H. ..... International Falls
§ Weir, Matthew J. ..... Virginia
§ Wilbur, Oscar M., Jr. ..... Hibbing
§ Will, Charles B. ..... International Falls
§ Woodruff, Whitney ..... Virginia

RED RIVER VALLEY MEDICAL SOCIETY

Kittson, Mahnomen, Marshall, Norman, Pennington, Polk, Red Lake and Roseau Counties
Regular meetings, quarterly
Annual meeting, December
Number of Members—59

President
CLAPP, H. D. ..... Crookston

Secretary
SATHER, RUSSELL O. ..... Crookston

§ Anderson, Wallace E. ..... Clearbrook
§ Behr, Orlo K. ..... Crookston
§ Berg, Arnold M. ..... Roseau
Berge, David O. ..... Roseau
† Biedermann, Jacob ..... Thief River Falls
Boroson, Hugh N. ..... Thief River Falls
Boyer, George S. ..... Crookston
† Bratrud, Edward ..... Thief River Falls
§ Brink, Adlai A. ..... Baudette
§ Cameron, John H. ..... Crookston
§ Clapp, Hubert D. ..... Crookston
§ Covey, Kenneth ..... Crookston
§ Dale, Lester N. ..... Red Lake Falls
§ Delmore, John L., Jr. ..... Roseau
§ Edwards, Robert V. ..... Crookston
§ Erickson, Eskil ..... Halstad
§ Flancher, Leon H. ..... Crookston
§ Foderick, Peter P. ..... Hallock
§ Giesbrecht, A. ..... Hallock
§§ Greene, Daniel E. ..... Thief River Falls
§§ Hirsh, Stanton A. ..... Crookston
§§ Holmstrom, Carle H. ..... Warren
§§ Janecky, Allen G. ..... Baudette
§§ Jensen, John A. ..... Crookston
§§ Kinkade, Byron R. ..... Ada
§§ Klefstad, Lloyd H. ..... Greenbush
§§ Kostick, William R. ..... Fertile
§§ Loken, Theodore ..... Ada
§§ Lynde, Orrin G. ..... Los Gatos, Calif.
§§ McKaig, Alan M. ..... Red Lake Falls
§§ Martin, George B. ..... Thief River Falls
§§ Mercil, William F. ..... Crookston
§§ Mochal, Milo A. ..... Thief River Falls
§§ Mueller, Donald R. ..... Bagley
† Nelson, Henry E. ..... Crookston
§§ Potts, L. C. ..... Warroad
§§ Oppegaard, Chester L. ..... Crookston
§ Pumala, Erven E. ..... Warren
§§ Reff, Alan R. ..... Crookston
§§ Roholt, Christian ..... McIntosh
§§ Roholt, Hartvig B. ..... Fosston
§§ Sather, Edgar L. ..... Fosston
§§ Sather, George A. ..... Fosston
§ Sather, Richard N. ..... Fosston
§§ Sather, Russell O. ..... Crookston
§§ Scheuneman, Allen F. ..... Warroad
§§ Schnabel, Robert F. ..... Crookston
§§ Schossow, George W. ..... Erskine
§§ Skogerboe, Rudolph B. ..... Karlstad
§§ Stadem, Clifford J. ..... Twin Valley
§§ Starekow, Milton D. ..... Thief River Falls
§§ Stensgaard, Kermit L. ..... Thief River Falls
§ Stewart, Donald E. ..... Crookston
§§ Thorsgard, Ernest O. ..... Thief River Falls
§§ Thysell, Harold R. ..... Crookston
§§ Uhley, Charles G. ..... Crookston
§§ Van Roov, George T. ..... Thief River Falls
§§ Wendt, H. Paul ..... Thief River Falls
§ Wikoff, Howard M. ..... Crookston

RENVILLE-REDWOOD COUNTY MEDICAL SOCIETY

Renville and Redwood Counties
Regular meetings, third Tuesday of each month
Annual meeting, December
Number of Members—25

President
STRAUCHLER, JOHN ..... Belview

Secretary
FLINN, J. B. ..... Redwood Falls

§ Alcorn, William J. ..... Wabasso
§ Alton, Donald G. ..... St. Paul
§ Anderson, Chester A. ..... Hector
§ Billings, Ralph E. ..... Franklin
† Brand, William A. ..... Redwood Falls
§ Ceplecha, Stanley F. ..... Redwood Falls
§ Cosgriff, James A. ..... Olivia
Cosgriff, James A., Jr. ..... Olivia
§ Diessner, Ardell W. ..... Redwood Falls
§ Dordal, John ..... Sacred Heart
† Fawcett, Arthur M. ..... Renville
† Flinn, James B. ..... Redwood Falls
† Flinn, Thomas E. ..... Remer
§ Gustafson, Robert W. ..... Fairfax
§ Hinderaker, Harris P. ..... Bird Island
§ Inglis, William ..... Redwood Falls
Johnson, Orville H. ..... Edina
§ Johnson, William E. ..... Morgan
§ Knoche, Harvey A. ..... Morgan
§ Lenz, Joseph R. ..... Morton
§ Metz, Donald D. ..... Buffalo Lake
Nelson, Glenn E. ..... Fairfax
§ Pierce, Robert B. ..... Renville
† Preisinger, Joseph W. ..... Dallas, Texas
§ Strauchler, Jonas ..... Belview

RICE COUNTY MEDICAL SOCIETY

Rice County
Regular meetings, third Tuesday of each month
Annual meeting, in October
Number of Members—33

President
FURLOW, WILLIAM L. ..... Faribault

Secretary
RYSGAARD, G. N. ..... Northfield

Beaton, J. Gordon ..... Northfield
Bruhl, Heinz H. ..... Faribault
Buesgens, Ralph H. ..... Waterville
*†§Dungay, Neil S. ..... Northfield
§ Engberg, Edward J. ..... Faribault
Francis, David W. ..... Morristown
§ Furlow, William L. ..... Faribault
Good, Roy H. ..... Northfield
Graham, Asa B. ..... Faribault
§ Haas, Jack F. ..... Northfield
*†§Hanson, Adolph M. ..... Faribault
Hanson, John W. ..... Northfield
† Huxley, Frederick R. ..... Faribault
Kennedy, George L. ..... Faribault
§ Kolars, James J. ..... Faribault
§ Lende, Norman ..... Faribault
Meyer, Paul F. ..... Faribault
Meyer, Robert P. ..... Faribault
Moses, Royal R. ..... Kenyon
§ Nelson, Ernest J. ..... Lonsdale
§ Nuetzman, Arthur W. ..... Faribault
§ Orr, Burton A. ..... Faribault
Ozolins, Marta ..... Faribault
Petersen, Donald H. ..... Northfield
§ Robilliard, Charles M. ..... Faribault
Rumpf, Carl W. ..... Faribault
§ Rysgaard, George N. ..... Northfield
§ Smith, Thorsten ..... Faribault
§ Street, Bernard ..... Northfield
Studer, Donald J. ..... Faribault
Traeger, Carl A. ..... Faribault
Weaver, Paul H. ..... Faribault
§ Wilson, Warren E. ..... Northfield

ST. LOUIS COUNTY MEDICAL SOCIETY

Carlton, Cook, Lake and Southern Portion of St. Louis Co.
Regular meetings, second Thursday except July and August
Annual meeting, second Thursday in January
Number of Members—198

President
BARDON, RICHARD ..... Duluth

Secretary
GOLDISH, R. J. ..... Duluth

Executive Secretary
GILBERT, MRS. MARGARET B. ..... Duluth

§ Abraham, Arden L. ..... Duluth
§ Ahrens, Curtis F. ..... Duluth
§ Asta, Joseph J. ..... Duluth
§ Athens, Alvin G. ..... Duluth
§ Atmore, William G. ..... Duluth
§ Aufderheide, Arthur C. ..... Duluth
Backus, Byron C. ..... Cloquet
§ Backus, Reno W. ..... Nopeming
§ Bagley, Charles M. ..... Duluth
Bagley, Elizabeth C. ..... Duluth
§†Bagley, William R. ..... Duluth
§ Bakkila, Henry E. ..... Duluth
§ Balmer, Albert I. ..... Duluth
§ Bardon, Richard ..... Duluth
§ Barker, John D. ..... Duluth
† Barney, Leon A. ..... Duluth
§ Barrett, Earl E. ..... Duluth
§ Bartzen, Peter J. ..... Duluth
§ Becker, Frederick T. ..... Duluth
§ Bell, Harry M., Jr. ..... Duluth
Bepko, Marie K. (Mrs. Puumala) ..... Cloquet
Berdez, George L. ..... Duluth
§ Bergan, Robert O. ..... Duluth
§ Bianco, Anthony J. ..... Duluth
§ Bloom, Joseph ..... Silver Bay
Boman, Paul G. ..... Duluth
§ Boyer, Sam H., Jr. ..... Duluth
§ Bray, Philip N. ..... Duluth
† Brooker, Warren J. ..... Minneapolis
§ Brown, Cyrus C., Jr. ..... Duluth
§ Buckley, Robert P. ..... Duluth
§ Butler, John K. ..... Cloquet
§ Christensen, Clarence H. ..... Duluth
Chrzan, Donald J. ..... Duluth
Clark, Elizabeth A. (Mrs. Halbert) ..... Duluth
§ Clark, Ivan T. ..... Duluth
§ Coll, James J. ..... Duluth
† Collins, Arthur N. ..... Duluth
§ Conley, Francis W. ..... Duluth
§ Coventry, William D. ..... Duluth
§ Cowan, George M. ..... Duluth
Crook, Rudolph L. ..... Duluth
§ Deutsch, Robert J. ..... Duluth
§ Dickson, Franklin H., Jr. ..... Proctor
§ Dwyer, John J. ..... Duluth
§ Eckman, Philip F. ..... Duluth
§ Eckman, Ralph J. ..... Duluth
† Ekblad, John W. ..... Rock Island, Ill.
§ Eklund, Carl D. ..... Duluth
§ Elias, Frank J. ..... Duluth
§ Emanuel, Karl W. ..... Duluth
Eppard, Raymond M. ..... Cloquet
§ Fawcett, Keith R. ..... Duluth
§ Fellows, Manley F. ..... Duluth
Ferrand, Paula T. ..... Moose Lake
§ Feuling, John C. ..... Duluth
§ Fifield, Malcolm M. ..... Duluth
§ Fischer, Mario M. ..... Duluth
§ Fisketti, Henry ..... Duluth
§ Fuller, Josiah ..... Duluth
§ Gillespie, Malcolm G. ..... Duluth
§ Goldish, Daniel R. ..... Duluth
§ Goldish, Robert J. ..... Duluth
§ Goldschmidt, Volker ..... Duluth
§ Goodnow, William H. ..... Duluth
§ Gowan, Lawrence R. ..... Duluth
§ Grohs, William H. ..... Duluth
§ Haase, Donald D. ..... Silver Bay
§ Haavik, John E. ..... Duluth
§ Halbert, John J. ..... Duluth
§ Halliday, Phillip V. ..... Duluth
† Haney, Claude L. ..... Duluth
Hanson, Ernest O. ..... Cloquet
§ Harrington, Vernon A., Jr. ..... Duluth
†§Hatch, Walter E. ..... Duluth
§ Hilding, Anderson C. ..... Duluth
† Hill, Frederick E. ..... Riverside, Calif.
† Hirschboeck, Frank J. ..... Duluth
§ Hoeg, Dwight C. ..... Duluth
§ Hoff, Herbert O. ..... Duluth
§ Houkom, Samuel S. ..... Duluth
Hutchinson, Henry ..... Moose Lake
§ Jacobson, Ferdinand C. ..... Duluth
†§Jensen, Thorvold J. ..... Duluth
§ Jeronimus, Henry J. ..... Duluth
Jessico, Charles M. ..... Duluth
John, Robert H. ..... Duluth
§ Johnson, Karl E. ..... Duluth
§ Jorgenson, Edward O. ..... Duluth
§ Juntunen, Roy R. ..... Duluth
† Kelley, Walter M. ..... Madison, Wis.
†§Klein, Harry ..... Duluth
§ Klein, William A. ..... Duluth
§ Knapp, Frank N. ..... Duluth
§ Knoedler, John P. ..... Duluth
§ Kohlbry, Carl O. ..... Duluth
Kosiak, William ..... Two Harbors
Kozberg, Oscar ..... Moose Lake
§ Krueger, Victor R. ..... Nopeming
§ LaBree, Robert H. ..... Duluth
†§Laird, Arthur T. ..... Duluth
Larson, Keith D. ..... Moose Lake
§ Latterell, Kenneth E. ..... Duluth
§ Leek, Joseph H. ..... Duluth
† Lepak, Francis J. ..... Duluth
Leppo, N. Erkki A. ..... Duluth
L'Esperance, Bernard F. ..... Two Harbors
Linke, Charles A. ..... Duluth
Linke, Clara L. ..... Duluth
§ Litman, Samuel N. ..... Duluth
§ Lund, Chester A. E. ..... Duluth
† McCoy, Mary K. ..... Duluth
† McDonald, Archibald L. ..... Duluth
McDonald, Owen G. ..... Duluth
§ McHaffie, Orval L. ..... Duluth
§ McNutt, John R. ..... Duluth
§ MacRae, Gordon C. ..... Duluth
§ Magney, Fredolph H. ..... Duluth
§ Marrone, Patrick H. ..... Duluth
§ Martin, Webster C. ..... Duluth
§ Martin, William B. ..... Duluth
§ Mayne, Roy M. ..... Nopeming
† Mead, Charles H. ..... Duluth
Miesfeld, Roger R ..... Duluth
Moe, Thomas ..... Moose Lake
§ Moehring, Henry G. ..... Duluth
§ Monserud, Nels O. ..... Cloquet
§ Moyer, John B. ..... Duluth
§ Munger, James E. ..... Duluth
Munson, Martin S. ..... Barnum
†§Nicholson, Murdoch A ..... Duluth
§ Nisius, George F. ..... Duluth

§ Norberg, Carl E. ..... Cloquet
§ Nutting, Roland E. ..... Duluth

§ O'Neill, John C. ..... Duluth
§ Olson, Albert E. ..... Duluth
§ Olson, Archie O. ..... Duluth

§ Papermaster, Ralph ..... Two Harbors
§ Parson, E. Irvine ..... Duluth
§ Pasek, Antone W. ..... Cloquet
§ Patch, Orien B. ..... Duluth
§ Pedersen, Roy C. ..... Duluth
† Pennie, Daniel F. ..... Duluth
§ Peterson, John H. ..... Duluth
§ Pollard, William S. ..... Duluth
Potter, Paul H. ..... Duluth
Power, John E. ..... Duluth
§ Power, John E., Jr. ..... Duluth
Puumala, Reino H. ..... Cloquet

Reardon, Andrew E. ..... Duluth
Reed, Henry H. ..... Duluth
† Rowe, Olin W. ..... Duluth
§ Rudie, Peter S. ..... Duluth
§ Rudie, William D. ..... Duluth

§ Runquist, John M. ..... Duluth
Ruth, Bradley R. ..... Duluth
Ryan, William J. ..... Duluth

§ Sach-Rowitz, Alvan ..... Moose Lake
Sanford, John B. ..... Duluth
†§Sarff, Oliver E. ..... Duluth
Sax, Milton H. ..... Duluth
Sax, Simon G. ..... Duluth
§ Schmid, John F. ..... Duluth
§ Schneider, Lawrence E. ..... Duluth
† Schroder, Charles H. ..... Pottstown, Penn.
§ Seashore, Rosel T. ..... Duluth
§ Smith, Cyril M. ..... Duluth
Smith, Wallace R. ..... Grand Marais
§ Soderberg, Richard J. ..... Grand Marais
§ Spang, Anthony J. ..... Duluth
§ Spang, James S. ..... Duluth
§ Spang, William M. ..... Duluth
§ Stein, William A. ..... Duluth
§ Storsteen, Kenneth A. ..... Duluth
§ Streitz, John M. ..... Duluth
§ Strewler, Gordon J. ..... Duluth
§ Swedberg, William A. ..... Duluth

§ Swenson, Arnold O. ..... Duluth
Teich, Kenneth W. ..... Duluth
§ Terrell, Bernard J. ..... Nopeming
§ Tetlie, James P. ..... Duluth
§ Thomas, John V. ..... Duluth
§ Tosseland, Noel E. ..... Duluth
§ Trautmann, James C. ..... Duluth
† Tuohy, Edward L. ..... Santa Barbara, Calif.
§ Tuura, James L. ..... Duluth

§ Van Puffelen, Paul S. ..... Duluth
Van Ryzin, Donald J. ..... Duluth

§ Walder, Harold J. ..... Duluth
† Walker, Alfred E. ..... St. Paul
§ Wallace, Martin O. ..... Duluth
§ Wells, Arthur H. ..... Duluth
†§Wheeler, Daniel W. ..... Fort Lauderdale, Fla.
§ Williams, Bruce F. P. ..... Duluth
† Winter, John A. ..... Duluth
†§Wolff, John M. ..... Duluth

§ Young, Thomas O. ..... Duluth

§ Zemmers, Roberts ..... Duluth

SCOTT-CARVER COUNTY MEDICAL SOCIETY

Scott and Carver Counties
Regular meetings, fourth Thursday of all months, except July and August
Annual meeting in June
Number of Members—31

President
CLARKE, JOHN W. ..... Waconia
Secretary
HEINZERLING, CARL R. ..... Chaska

§ Bean, Charles N. ..... Waconia
§ Bingham, Geo. C. ..... Chaska
§ Bratholdt, James W. ..... Watertown
† Buck, Frederick H. ..... Shakopee
§ Cervenka, Charles F. ..... New Prague
§ Clarke, John W. ..... Waconia
§ Doherty, Elmer M. ..... New Prague

†§Hebeinsen, Milton B. ..... Carver
Heinz, Ivy B. ..... Shakopee
§ Heinzerling, Carl R. ..... Chaska
§ Juergens, Herman M. ..... Belle Plaine
Kucera, Stanley T. ..... Northfield
§ Larson, Leighton W. ..... Waconia
§ Lukk, Olaf ..... Montgomery
† Martin, Thomas Philip ..... Minneapolis
Nagel, Harold D. ..... Minneapolis
Ninneman, Newton N. ..... Waconia
† Novak, Edward E. ..... New Prague
Olson, Chester J. ..... Belle Plaine

§ Pearson, Bror F. ..... Shakopee
Philp, David R. ..... Watertown
§ Ponterio, James E. ..... Shakopee
Rieschl, Elizabeth K. ..... Jordan
§ Rynda, Edwin R. ..... New Prague
§ Sawaryniuk, Iwan ..... Waconia
Schimelpfenig, George T. ..... Chaska
Simmonds, Harry N. ..... Prior Lake
§ Simons, Bernard H. ..... Chaska
Stahler, Paul A. ..... Jordan
†§Westerman, Alvin ..... Montgomery
† Westerman, Fred C. ..... Montgomery

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

Cottonwood, Jackson, Murray, Nobles, Pipestone, and Rock Counties
Regular meetings, Spring and Fall
Annual meeting, October-November
Number of Members—63

President
BOFENKAMP, F. W. ..... Luverne
Secretary
HEIBERG, OLAF M. ..... Worthington

§ Arnold, Elmer W. ..... Adrian
§ Bader, J. L. ..... Slayton
Basinger, Harold P. ..... Windom
§ Basinger, Homer P. ..... Windom
§ Beckering, Gerrit ..... Edgerton
§ Benjamin, Walter G. ..... Pipestone
§ Bofenkamp, F. William ..... Luverne
§ Boone, Erwin S. ..... Luverne
Boyd, Frank E. ..... Jasper
Buresh, Kenneth L. ..... Westbrook
§ Carlson, John V. ..... Westbrook
§ Christiansen, Harold A. ..... Jackson
§ Dawson, Lorin D. ..... Worthington
Dokken, James H. ..... Windom
Doman, Victor W. ..... Lakefield
Goering, Emil ..... Mountain Lake
Hallin, Roger P. ..... Worthington
§ Halloran, Walter H. ..... Jackson

§ Halpern, David J. ..... Brewster
Halvorson, Harold C. ..... Luverne
Harada, Thomas T. ..... Lake Wilson
§ Harrison, Percy W. ..... Worthington
§ Heiberg, Olaf M. ..... Worthington
§ Hoyer, Ludolf J. ..... Windom
Karleen, Bernard N. ..... Jackson
§ Keves, Robert W. ..... Pipestone
§ Kilbride, Edwin A. ..... Worthington
§ Koenecke, Fred H. ..... Lakefield
§ Kotval, Russell J. ..... Pipestone
§ Laikola, Leslie A. ..... Adrian
§ Lohmann, John G. ..... Pipestone
§ Maitland, Edwin T. ..... Jackson
† Manson, Frank M. ..... Worthington
§ Martin, Albert C. ..... Luverne
§ Minge, Raymond K. ..... Worthington
§ Nealy, Donald E. ..... Adrian
Nicholson, R. W. ..... Heron Lake
Nywall, Dean D. ..... Slayton
§ Odland, Donald M ..... Luverne
†§Pankratz, Peter J. ..... Taiwan (Formosa)
§ Patterson, Hugh D. ..... Slayton

§ Pierson, Roy F. ..... Slayton
†§Piper, William A. ..... Mountain Lake
Plott, Carol L. ..... Heron Lake
§ Plucker, Milton W. ..... Worthington
‡ Ritzinger, Frederick R. ..... Gowrie, Iowa
§ Robinett, Robert W. ..... Worthington
§ Rohrer, Christian A. ..... Worthington
§ Rose, John T. ..... Lakefield
Ryding, Vincent ..... Mountain Lake
§ Sawtell, Robert R. ..... Worthington
§ Schade, Frederick L. ..... Worthington
§ Schutz, Elmer S. ..... Mountain Lake
§ Sherman, Charles L. ..... Luverne
*§Slater, Sidney A. ..... Worthington
§ Stam, John ..... Worthington
Stevenson, Basil M. ..... Fulda
§ Stratte, Harold C. ..... Windom
§ Vix, Vernon A. ..... Worthington
§ Wells, Walter B. ..... Jackson
† Williams, Charles A. ..... Seattle, Washington
*†Williams, Leon A. ..... Lester Prairie
‡ Zeller, Nichols H. ..... Unknown

STEARNS-BENTON COUNTY MEDICAL SOCIETY

Stearns and Benton Counties
Regular meetings, third Thursday of month
Annual meeting, December
Number of Members—74

President
THURINGER, CARL B. ..... St. Cloud
Secretary
MURN, THOMAS G. ..... St. Cloud

§ Alden, W. Charles ..... Kimball
Aulick, Ernest J. ..... Paynesville
§ Autrey, William A. ..... St. Cloud
§ Baumgartner, Florian H. ..... Albany
§ Beuning, John B. ..... St. Cloud

§ Brigham, Charles F., Jr. ..... St. Cloud
§ Broker, Henry M. ..... St. Cloud
§ Buscher, Julius C. ..... St. Cloud
Cesnik, Robert J. ..... Sauk Rapids
§ Clark, Harry B. ..... St. Cloud
Cleaves, William D. ..... Sauk Centre
§ Davis, Arthur E., Jr. ..... St. Cloud
Davidson, William D. ..... St. Joseph
§ Donaldson, Charles S. ..... St. Cloud

† DuBois, Julian F. ..... Sauk Centre
DuBois, Julian F., Jr. ..... Sauk Centre
§ Evans, Leslie M. ..... Sauk Rapids
Fidelman, Norman E. ..... Foley
†§Fleming, Thomas N. ..... St. Cloud
§ Gaida, Joseph B. ..... St. Cloud
§ Goehrs, Gilman H. ..... St. Cloud
† Goehrs, Henry W. ..... St. Cloud
Grant, John C. ..... Sauk Centre

† Haberman, Emil ..... Osakis
Halenbeck, Philip L. ..... St. Cloud
† Handler, Seymour ..... Minneapolis
Hedlund, Charles J. ..... St. Paul
Henry, Clarence J. ..... Milaca
Henry, Joseph E. ..... Milaca
†§Jones, Richard N. ..... St. Cloud
Keith, Paul J. ..... Milaca
Kelly, James H. ..... St. Cloud
§ Kelly, John F. ..... Cold Spring
Kline, Richard F. ..... St. Cloud
† Koenig, Robert P. ..... Minneapolis
† Kohler, Delphin W. ..... Tacoma, Washington
‡§Koop, Severin H., Jr. ..... Sauk Rapids
Kuhlmann, Lawrence B. ..... Melrose
§ LaFond, Edward M. ..... St. Cloud
§ Lindley, Stanley B. ..... St. Cloud
Lindeman, Raymond J. ..... Paynesville
§ Loes, Louis A. ..... St. Cloud
*§Luckemeyer, Carl J. ..... St. Cloud
†§McDowell, John P. ..... St. Cloud
† Meyer, Anthony A. ..... Minneapolis
§ Milhaupt, Emmett N. ..... St. Cloud
Mueller, Rudolph B. ..... Richmond
Murn, Thomas G. ..... St. Cloud
§ Musachio, Nicholas F. ..... Foley
Myre, Clifford R. ..... Paynesville
§ Neils, Vernon E. ..... Sauk Rapids
§ Nessa, Curtis B. ..... St. Cloud
Nietfield, Aloys ..... Sauk Centre
§ O'Keefe, James P. ..... St. Cloud
§ Olinger, John N. ..... St. Cloud
§ Petersen, Robert T. ..... St. Cloud
§ Phares, Otto C. ..... St. Cloud
§ Raetz, Sylvester J. ..... Maple Lake
§ Reif, Henry J. ..... St. Cloud
§ Richards, William B. ..... St. Cloud
Rozychi, Anthony ..... St. Cloud
Salk, Richard J. ..... Albany
†§Sandven, Nels O. ..... Paynesville
§ Schmitz, Everett J. ..... St. Cloud
§ Sisk, Harvey E. ..... St. Cloud
† Stangl, Philip E. ..... St. Cloud
§ Thuringer, Carl B. ..... St. Cloud
Undem, Dale W. ..... St. Cloud
Vanderpool, Thomas E. ..... Paynesville
§ Veranth, Leonard A. ..... St. Cloud
§ Walfred, Karl A. ..... St. Cloud
§ Wenner, Waldemar T. ..... St. Cloud
§ Wittrock, Louis H. ..... Watkins
Zachman, Albert H. ..... Melrose

STEELE COUNTY MEDICAL SOCIETY

Steele County

Regular meetings, third Tuesday of every other month

Annual meeting, January

Number of Members—22

President
FISCHER, JOHN R. ..... Blooming Prairie
Secretary
FLOERSCH, ADRIAN J. ..... Owatonna

§ Anderson, Franklin C. ..... Owatonna
Arnesen, John F. ..... Owatonna
§ Dewey, Donald H. ..... Owatonna
§ Fischer, John R. ..... Blooming Prairie
Floersch, Adrian J. ..... Owatonna
§ Halvorsen, Daniel K. ..... Owatonna
Hartung, Elmer H. ..... Claremont
§ Henry, Kenneth G. ..... Owatonna
Honath, Donald H. ..... Owatonna
§ Huff, J. S. ..... Owatonna
Kulstad, Oscar S. ..... Dodge Center
§ Lundquist, Curt W. ..... Owatonna
§ McEnaney, Clifford T. ..... Owatonna
§ McIntyre, John A. ..... Owatonna
†§Melby, Benedik ..... Blooming Prairie
† Morehead, Dewey E. ..... Unknown
§ Olson, Albert J. ..... Owatonna
§ Roberts, Oliver W. ..... Owatonna
† Senn, Edward W. ..... Owatonna
§ Schaefer, Joseph F. ..... Owatonna
§ Stransky, Theodore W. ..... Owatonna
†§Wilkowske, Rudolph J. ..... Owatonna

UPPER MISSISSIPPI MEDICAL SOCIETY

Aitkin, Beltrami, Cass, Clearwater, Crow Wing, Hubbard, Lake of the Woods, Morrison, Todd and Wadena Counties

Regular meeting not set

Annual meeting, January

Number of Members—99

President
DEWEESE, W. J. ..... Bemidji
Secretary
BADEAUX, GEORGE I. ..... Brainerd

Adkins, James J. ..... Bertha
Aga, John H. ..... Brainerd
§ Anderson, Arden O. ..... Brainerd
Anderson, Werner W. ..... Brainerd
Badeaux, George I. ..... Brainerd
Belcher, Royden A. ..... Little Falls
Bender, James H. ..... Brainerd
§ Benson, Alfred H. ..... Little Falls
Bissinger, Lester L. ..... Brainerd
§ Bolstad, Owen C. ..... Little Falls
§ Borgerson, Arthur H. ..... Long Prairie
Brown, Russell T. ..... Browerville
Burman, Richard E. ..... Aitkin
Cardle, George E. ..... Brainerd
Closuit, Frederick C. ..... Aitkin
Cook, Jay M. ..... Staples
§ Coombs, Carl H. ..... Cass Lake
Craig, C. C. ..... International Falls
Crow, Earl R. ..... Ah-Gwah-Ching
Davis, Lloyd T. ..... Wadena
§ Davis, Luther F. ..... Wadena
Deweese, Wilford J. ..... Bemidji
Dillenburg, C. J. ..... Little Falls
Dodson, Albertus F. ..... Brainerd
Erickson, Alvin O. ..... Long Prairie
§ Fitzsimons, William E., Jr. ..... Brainerd
Fortier, George M. A. ..... Little Falls
Garlock, DeWitt W. ..... Highlands, Calif.
† Ghostley, Mary C. ..... Santa Ana, Calif.
Griffin, John W., Jr. ..... Bemidji
Grimes, Paul T ..... Park Rapids
Groschupf, Richard P. ..... Bemidji
Groschupf, Theodore P. ..... Bemidji
§ Grose, Frederick N. ..... Clarissa
Halme, William H. ..... Wadena
Halverson, Kermit J. ..... Chisholm
Hansen, Milo L. ..... Little Falls
Hartjen, Jason K. ..... Bemidji
Heid, James K. ..... Little Falls
† Healy, Raymond T. ..... Pierz
Hendricks, Esten J. ..... Verndale
Hildebrand, John E. ..... Bemidji
Hoganson, Donald E. ..... Bemidji
Hughes, Bernard J. ..... Brainerd
§ Johnson, Douglas L. ..... Little Falls
† Johnson, Einar W. ..... Bemidji
§ Kanne, Earl R. ..... Brainerd
§ Kelley, Roger E. ..... Crosby
Knoll, W. V. ..... Brainerd
Larson, LeRoy J. ..... Bagley
Lee, Hubert W. ..... Brainerd
†§Lenarz, Albert ..... Browerville
Longfellow, Helen W. ..... Brainerd
Lund, Werner J. ..... Staples
Lundsten, Leslie C. ..... Bemidji
§ McLane, William O. ..... Brainerd
Marshall, Clark M. ..... Crosby
Marvin, Joseph E. ..... Brainerd
§ Meller, Maurice ..... Brainerd
Mortenson, Howard O. ..... Menahga
Mosby, Maurice E. ..... Long Prairie
§ Mulligan, Arthur M. ..... Brainerd
Murtaugh, Robert I. ..... Wadena
Nichols, Raymond D. ..... Crosby
Nixon, James B. ..... Crosby
Nord, J. Erling ..... Staples
Nordlund, Mildred E. ..... Cass Lake
§ O'Leary, John B. ..... Brainerd
Olson, Lillian A. ..... Ah-Gwah-Ching
Palmer, Harry A. ..... Black Duck
Parker, Charles W. ..... Wadena
Parker, Warren E. ..... Sebeka
§ Pedersen, Robert L. ..... Brainerd
Pelzl, Charles R. ..... Pine River
Petraborg, Harvey T. ..... Aitkin
Pettersen, George R. ..... Aitkin
Pierce, Charles H. ..... Wadena
Ouanstrom, Virgil E. ..... Brainerd
Ouast, John E. ..... Long Prairie
Reichelderfer, Charles F. ..... Staples
Reichelt, Leland G. ..... Wadena
§ Ringle, Otto F. ..... Walker
† Sanderson, Anton G. ..... Ashby
* Simons, Edwin J. ..... Edina
Spieler, Forrest B. ..... Pequot Lakes
§ Stein, Raymond J. ..... Pierz
§ Stoy, Robert A. ..... Little Falls
Spurbeck, George H. ..... Bemidji
Ulrich, Emery E. ..... Crosby
Vandersluis, Charles W. ..... Bemidji
§ Watson, Alexander M. ..... Royalton
† Watson, Percy T. ..... Miami, Fla.
Watson, Sidney W. ..... Royalton
Westley, Kent ..... Little Falls
Whittemore, Dexter D. ..... Bemidji
Will, William W. ..... Bertha
Williams, Mervyn M. ..... Ah-Gwah-Ching
* Winquist Carl G. ..... Crosby
Witter, Robert L. ..... Wadena

WABASHA COUNTY MEDICAL SOCIETY

Wabasha County

Regular meeting, special call

Annual meeting, first Thursday after first Monday in October

Number of Members—15

President
FLATT, JOHN R. ..... Wabasha
Secretary
MAHLE, DONALD G. ..... Plainview

§ Bayley, E. Covell ..... Lake City
§ Bouquet, Bertram J. ..... Wabasha
§ Bowers, Robert N. ..... Lake City
† Collins, Joseph S. ..... Wabasha
§ Ekstrand, LeRoy M. ..... Wabasha
§ Ellis, Earl Wm. ..... Elgin
§ Flatt, John R. ..... Wabasha
*§Flesche, Bernard A. ..... Lake City
§ Gjerde, William P. ..... Lake City
Glabe, Robert A. ..... Plainview
Habein, Harold C. ..... Wabasha
§ Mahle, Donald G. ..... Plainview
§ Ochsner, Clarence G. ..... Wabasha
† Replogle, William H. ..... Los Angeles, Calif.
§ Sontag, David W. ..... Lake City

WASECA COUNTY MEDICAL SOCIETY

Waseca County
Regular meetings, January
Annual meeting, January
Number of Members—8

President
OELJEN, S. C. G. ..... Waseca
Secretary
FLORINE, MARTIN C. ..... Janesville

§ Davis, Raymond D. ..... Waseca
§ Florine, Martin C. ..... Janesville
†§Gallagher, Bernard J. ..... Waseca
§ Hottinger, Raymond C. ..... Janesville

§ Normann, Stephen T., Jr. ..... Waseca
§ Oeljen, Siegfried C. G. ..... Waseca
§ Olds, George H. ..... New Richland
§ Swenson, Orvie J. ..... Waseca

WASHINGTON COUNTY MEDICAL SOCIETY

Washington and Dakota Counties
Regular meetings, second Tuesday in each month except June, July, and August
Annual meeting, December
Number of Members—23

President
SHERMAN, C. H. ..... Bayport
Secretary
JOHNSON, ROBERT H. ..... Bayport
Brabec, Paul F. ..... Hastings
Carlson, Russel E. ..... Stillwater
Chappell, Elliott R. ..... Stillwater
Fasbender, Herman T. ..... Hastings
† Holcomb, Joel T. ..... Marine-on-St. Croix

*†Humphrey, Wade R. ..... Stillwater
§ Jenson, James E. ..... Stillwater
§ Johnson, Robert H. ..... Bayport
Johnson, O. Guy ..... Bayport
Josewski, Raymond J. ..... Stillwater
§ Juergens, Manley F. ..... Stillwater
Just, Herman J. ..... Hastings
Kiolbasa, Edward B. ..... Stillwater
Kulzer, Norbert J. ..... Hastings

§ McCarten, Francis M. ..... Stillwater
† Mensheha, Nicholas ..... Minneapolis
Mitchell, G. S. ..... Stillwater
§ Poirier, Joseph A. ..... Forest Lake
Ruggles, George M. ..... Forest Lake
§ Sherman, Carnot H. ..... Bayport
§ Stuhr, John W. ..... Stillwater
Torghele, John R. ..... Hastings
Van Meier, Henry ..... Stillwater

WEST CENTRAL MINNESOTA MEDICAL SOCIETY

Big Stone, Pope, Stevens, and Traverse Counties
Regular meetings, first Wednesday in March, May, September, and November
Annual meeting in November
Number of Members—28

President
MAGNUSON, A. E. ..... Wheaton
Secretary
WINGE, H. C. ..... Wheaton
§ Arneson, Arthur I. ..... Morris
§ Behmler, Frederick Wm. ..... Morris
†§Bergan, Otto ..... Clinton
§ Bolsta, Charles ..... Ortonville
§ Bucher, Foster D. ..... Starbuck
†§Eberlin, Edward A. ..... Glenwood

§ Eide, O. A. ..... Hancock
† Elsey, James R. ..... Glenwood
§ Hedemark, Homer H. ..... Ortonville
Hedemark, Truman A. ..... Ortonville
Karn, Jacob F. ..... Ortonville
Kolp, Berton A. ..... Glenwood
§ Kooda, Jennings C. ..... Morris
§ Lee, Gordon E. ..... Glenwood
Letson, Robert D. ..... Glenwood
Lindberg, Alfred L. ..... Wheaton
*†§Linde, Herman ..... Cyrus

§ Magnuson, Allen E. ..... Wheaton
§ Merrill, Robert W. ..... Morris
* Muir, Walter E. ..... Browns Valley
§ Oliver, Irwin L. ..... Graceville
† Ranson, Matthias L. ..... Hancock
§ Rossberg, Raymond A. ..... Morris
§ Swedenburg, Paul A. ..... Glenwood
§ Swendseen, Carl J. ..... Graceville
§ Watson, Robert M. ..... Morris
§ Winge, H. C. ..... Wheaton
§ Zempel, Alan R. ..... Starbuck

WINONA COUNTY MEDICAL SOCIETY

Winona County
Regular meetings, first Monday in January, April, July, and October
Annual meeting, first Monday in January
Number of Members—32

President
WILSON, L. J. ..... Winona
Secretary
ROGERS, CHARLES W. ..... Winona
§ Boardman, Dalmon V. ..... Winona
§ Christensen, Eli E. ..... Winona
Degallier, Daniel ..... Winona
§ Finkelnburg, William O. ..... Winona
§ Hartwich, Roger F. ..... Winona
§ Hawk, Dale J. ..... St. Charles
§ Heise, Carl vR. ..... Winona

§ Heise, Paul vR. ..... Winona
§ Heise, Philip vR. ..... Winona
§ Hughes, Sidney O. ..... Winona
Johnson, Curtis M. ..... Winona
§ Johnston, Leonard F. ..... Winona
§ Keyes, John D. ..... Winona
§ Loomis, George L. ..... Winona
§ McHutchinson, Samuel ..... St. Charles
†§McLaughlin, Edmund M. ..... Winona
§ Mattison, Percy A. ..... Winona
§ Meinert, Albert E. ..... Winona
Neumann, Conrad A. ..... Lewiston

Page, Raymond L. ..... Minneapolis
† Robbins, Charles P. ..... Winona
§ Roemer, Henry J. ..... Winona
§ Rogers, Charles W. ..... Winona
§ Satterlee, Howard W. ..... Lewiston
§ Schmidt, Hilmar R. ..... Rushford
§ Testor, James V. ..... Winona
§ Tweedy, John A. ..... Winona
§ Vollmer, Frederick J. ..... Winona
§ Wilson, Louis J. ..... Winona
§ Wilson, Rolland H. ..... Winona
§ Younger, Lewis I. ..... Winona

WRIGHT COUNTY MEDICAL SOCIETY

Wright County
Regular meetings, first Tuesday of every second month
Annual meeting, in November
Number of Members—14

President
SMORSTOK, M. B. ..... Monticello
Secretary
CATLIN, THEODORE J. ..... Buffalo
§ Anderson, Waldo P. ..... Buffalo
§ Bendix, Lester H. ..... Annandale

†§Catlin, John J. ..... Buffalo
§ Catlin, Theodore J. ..... Buffalo
§ Ellison, Frank E. ..... Monticello
§ Greenfield, William T. ..... Cokato
§ Guilfoile, Pierre J. ..... Delano
§ Hall, William E. ..... Maple Lake

§ Hart, William E. ..... Monticello
§ Purves, G. Harland ..... Buffalo
§ Sandeen, Robert M. ..... Buffalo
§ Smorstok, Matthew B. ..... Monticello
§ Thielen, Robert D. ..... Saint Michael
§ Vaaler, Robert T. ..... Cokato

ZUMBRO VALLEY MEDICAL SOCIETY

Olmsted, Houston, Fillmore and Dodge Counties
Regular meetings, first Wednesday of odd numbered months
Annual meeting, first Wednesday in November
Number of members—555

President
HUNT, A. B. ..... Rochester

Secretary
WELLMAN, WILLIAM W. ..... Rochester

§ Aaro, Leonard A. ..... Rochester
§ Achor, Richard W. P. ..... Rochester
† Adams, Ralph E ..... Rochester
† Addison, Robert M. ..... Rochester
§ Adson, Martin A. ..... Rochester
§ Affeldt, Daniel E. ..... Kasson
§ Ahlfs, Jacob J. ..... Caledonia
Aigner, B. Robert ..... Rochester
Allaman, Loren E. ..... Rochester
§ Allen, Edgar V. N. ..... Rochester
† Amberg, Samuel ..... Rochester
§ Andersen, Howard A. ..... Rochester
§ Anderson, Mark J. ..... Rochester
§ Anderson, Markham J., Jr. ..... Rochester
§ Anderson, Milton W. ..... Rochester
† Angelos, S. Peter ..... Rochester
Arnold, John W. ..... Rochester
‡ Anzel, Sanford H. ..... Rochester
Baars, Conrad W. ..... Rochester
§ Baggenstoss, Archie H. ..... Rochester
§ Bair, Hugo L. ..... Rochester
¶ Bajec, Dusan ..... Belgrade, Yugoslavia
§ Baker, George S. ..... Rochester
† Baker, Harry R. ..... Hayfield
§ Baker, Hillier L., Jr. ..... Rochester
†§ Balfour, Donald C. ..... Rochester
Balfour, William M. ..... Lawrence, Kansas
§ Banner, Edward A. ..... Rochester
§ Bargen, J. Arnold ..... Rochester
§† Barker, Nelson W. ..... Rochester
†§ Barnes, Arlie R. ..... Rochester
§ Barry, Maurice J., Jr. ..... Rochester
§ Bartholomew, Lloyd G. ..... Rochester
§ Bastron, James A. ..... Rochester
† Battaile, William G. ..... Rochester
Battaglino, John J., Jr. ..... Rochester
§ Bayrd, Edwin D. ..... Rochester
§ Beahrs, Oliver H. ..... Rochester
† Beck, Richard L. ..... Rochester
† Benedict, William L. ..... Rochester
† Beetham, Wm. P., Jr. ..... Rochester
§ Berge, Kenneth G. ..... Rochester
† Beringer, E. Duane ..... Rochester
§ Berkman, John M. ..... Rochester
Berman, Harold ..... Rochester
† Berman, Irwin B. ..... Rochester
Berman, Stanley ..... Rochester
§ Bernatz, Philip E. ..... Rochester
§ Bianco, Anthony J. Jr. ..... Rochester
§ Bickel, William H. ..... Rochester
† Bigelow, Charles H. ..... Dodge Center
† Bigg, Richard L. ..... Rochester
Billingsley, John S. ..... Rochester
§ Black, B. Marden ..... Rochester
§ Blackburn, Charles M. ..... Rochester
† Bledsoe, Francis H. ..... Rochester
Boolukos, George P. N. ..... Rochester
† Botticelli, Max G. ..... Rochester
Bowen, Ralph, Jr. ..... Rochester
§ Boyd, David A., Jr. ..... Rochester
† Braasch, William F. ..... Rochester
§ Brandenburg, Robert O. ..... Rochester
† Breslin, Donald J. ..... Rochester
§ Broadbent, James C. ..... Rochester
§ Brodhun, John C. ..... Rochester
Brow, Raymond E. ..... Rochester
§ Brown, Alexander E. ..... Rochester
§ Brown, Henry A. ..... Rochester
§ Brown, Joe R ..... Rochester
§ Brown, Philip W. ..... Rochester
§ Brown, Robert C. ..... Rochester
§ Brunsting, Louis A. ..... Rochester
† Buie, Louis A. ..... Rochester
Buie, Louis A., Jr. ..... Rochester
§ Burchell, Howard B. ..... Rochester
Burgert, H. O., Jr. ..... Rochester
§ Burich, Harry F. ..... Rochester
§ Burke, Edmund C. ..... Rochester
§ Butt, Hugh R. ..... Rochester
† Bynum, Grover L., Jr. ..... Rochester
Cadman, Norman L. ..... Rochester
§ Cain, James C. ..... Rochester
§ Callahan, John A. ..... Rochester
† Calverley, John R. ..... Rochester
§ Campbell, Donald C. ..... Rochester
§ Campbell, Malcolm K. ..... Rochester
† Carnevali, John F. ..... Rochester
Carr, David T. ..... Rochester
§ Carryer, Haddon McC. ..... Rochester
† Carveth, Stephen W. ..... Rochester
§ Childs, Donald S., Jr. ..... Rochester
§ Christensen, Norman A. ..... Rochester
§ Clagett, O. Theron ..... Rochester
§ Clark, Edward C. ..... Rochester
† Clark, Lealand L. ..... Rochester
§ Clark, Leslie W. ..... Spring Valley
† Clifton, Theodore A. ..... Hollywood, Fla.
‡ Clowdus, Bernard F. ..... Bolling Air Force Base 25, D. C.
† Cody, D. Thane ..... Rochester
Coffey, William F. X. ..... Rochester
† Cohen, Ellen K. ..... Rochester
† Cohen, Hyman L. ..... Rochester
§ Colby, Malcolm Y., Jr. ..... Rochester
§ Connolly, Daniel C. ..... Rochester
Connor, P. James ..... Rochester
§ Cook, Edward N. ..... Rochester
Cooper, Talbert ..... Rochester
§ Corbin, Kendall B. ..... Rochester
Corr, William P. ..... Rochester
Corrigan, Cyril J. ..... Rochester
‡ Cottone, Francis J. ..... Trenton, New Jersey
† Coughlin, Dennis Jr. ..... Rochester
§ Coventry, Markham B. ..... Rochester
†§ Craig, Winchell McK. ..... Rochester
† Crandall, Earle E. ..... Rochester
§ Culp, Ormond S. ..... Rochester
§ Dahlin, David C. ..... Rochester
Daly, David D. ..... Rochester
§ Daugherty, Guy W. ..... Rochester
† Davidson, Paul ..... Rochester
† Davis, Austin C. ..... Florida
§ Davis, George D. ..... Rochester
§ Dearing, William H. ..... Rochester
Decker, David G. ..... Rochester
§ Devine, Kenneth D. ..... Rochester
§ DeWeerd, James H. ..... Rochester
§ Deissner, Grant R. ..... Rochester
§ Divertie, Matthew ..... Rochester
§ Dixon, Claude F ..... Rochester
Dobbs, Richard L. ..... Rochester
§ Dockerty, Malcolm B. ..... Rochester
Doerr, Gerhard M. ..... Minneapolis
† Dombrowski, Edmond T. ..... Rochester
§ Donoghue, Francis E. ..... Rochester
§ Douglass, Bruce E. ..... Rochester
§ Doyle, James R. ..... Rochester
† Drips, Della G. ..... Oronoco
Drv. Thomas J. ..... Capetown, Africa
§ DuShane, James W. ..... Rochester
§ Dyer, John Allen ..... Rochester
*§ Eaton, Lealdes M. ..... Rochester
† Edelstein, Jack P. ..... Rochester
§ Edwards, Jesse E. ..... Rochester
Edwin, Russell L. ..... Rochester
§ Elkins, Earl C. ..... Rochester
§ Ellis, F. Henry ..... Rochester
§ Emmett, John L. ..... Rochester
† Engler, Robert S. ..... Rochester
Englund, Garth W. ..... Mabel
§ Erich, John B ..... Rochester
§ Erickson, Donald J. ..... Rochester
† Esser, Robert A. ..... Paris, France
§ Estes, J. Earle, Jr. ..... Rochester
†§ Eusterman, George B. ..... Rochester
† Evarts, Arrah B. ..... Rochester
† Evenson, David J. ..... Rochester
§ Faber, John E. ..... Rochester
Fairbairn, John F. ..... Rochester
§ Faucett, Robert L. ..... Rochester
§ Faulconer, Albert, Jr. ..... Rochester
Faust, Herbert A ..... Rochester
† Feinerman, Burton ..... Brooklyn, N. Y.
§ Ferris, Deward O. ..... Rochester
†§ Figi, Frederick A. ..... Rochester
Foss, Edward L. ..... Rochester
§ Foulk, William T., Jr. ..... Rochester
† Francis, Robert L. ..... Rochester
Franckowiak, John J. ..... Rochester
§ Frethem, Allen A. ..... Rochester
Fricke, Robert E. ..... Rochester
†§ Gambill, Carl M. ..... Rochester
§ Gambill, Earl E. ..... Rochester
† Gannon, Paul G. ..... Rochester
Gastineau, Clifford F. ..... Rochester
† Gatzke, Lawrence D. ..... Rochester
§ Geraci, Joseph E. ..... Rochester
† Giffin, Herbert Z. ..... Rochester
§ Gifford, R. W., Jr. ..... Rochester
Giles, William F. ..... Rochester
‡ Gill, Charles Richard ..... Ft. Meade, Md.
† Gilloon, James R. ..... Rochester
Gilpin, Charles A., Jr. ..... Rochester
Glathe, John P. ..... Rochester
† Glick, Dallas D. ..... Rochester
§ Goldstein, Norman P. ..... Rochester
§ Good, C. Allen, Jr. ..... Rochester
‡ Gottlieb, Cornelius M. ..... Tacoma, Wash.
Gould, Allan B., Jr. ..... Rochester
† Granberry, Warren M. ..... Rochester
§ Graudins, Gunars ..... Rochester
Green, Paul A. ..... Rochester
§ Greene, Laurence F. ..... Rochester
Grindlay, John H. ..... Rochester
§ Gross, John B. ..... Rochester
Gyde, Maurice C. ..... Rochester
§ Hagedorn, Albert B. ..... Rochester
† Haines, Samuel F. ..... Rochester
§ Hallberg, Olav Erik ..... Rochester
† Hallenbeck, Dorr F. ..... Rochester
§ Hallenbeck, George A. ..... Rochester
‡ Hamilton, Warren W., Jr. ..... St. Albans, N. Y.
§ Hanlon, David G. ..... Rochester
§ Hanson, Norbert Orrin ..... Rochester
† Hargraves, Malcolm M. ..... Rochester
† Harrington, Stuart W. ..... Rochester
† Harris, Lloyd E. ..... Rochester
§ Harrison, Edgar G., Jr. ..... Rochester
†§ Hartman, Howard R. ..... Rochester
Hartridge, Virginia B. ..... Rochester
Hauser, Harris M. ..... Rochester
† Havens, Fred Z. ..... Riverside, Calif.
§ Hayles, Alvin B. ..... Rochester
§ Heck, Frank J. ..... Rochester
Hedrick, William L. ..... Rochester
Heilman, Fordyce R. ..... Rochester
† Helland, John W. ..... Grove Spring
*†§ Helmholz, Henry F. ..... Rochester
*† Hempstead, Bert E. ..... Rochester
Henderson, Edward D. ..... Rochester
§ Henderson, John W. ..... Rochester
§ Henderson, Lowell L. ..... Rochester
§ Hepper, Norman G. ..... Rochester
† Hewitt, Edith S. ..... Rochester
† Hewitt, Richard M. ..... Rochester
§ Higgins, John A. ..... Rochester
§ Hill, John Roger ..... Rochester
Hill, Richard Woolsey ..... Rochester
§ Hines, Edgar A., Jr. ..... Rochester
§ Hodgson, Corrin H. ..... Rochester
§ Hodgson, John R. ..... Rochester
Holland, C. R. ..... Rochester
§ Hollenhorst, Robert W. ..... Rochester
Holman, Colin B. ..... Rochester
† Holsinger, Donald R. ..... Rochester
† Hooker, John P. ..... Rochester
† Hopkins, Donald M. ..... Rochester
Howard, Eric G. ..... Spring Valley
†§ Horton, Bayard T. ..... Rochester
§ Howell, Llewelyn P. ..... Rochester
‡ Huff, James F. ..... Alexandria
§ Huizenga, Kenneth A. ..... Rochester
† Hunt, Arthur B. ..... Rochester
† Hunt, James Calvin ..... Rochester
† Hunt, James Cleon ..... Rochester
§ Hunter, James S., Jr. ..... Rochester
‡ Inlow, Robert P. ..... Rochester
§ Ivins, John C. ..... Rochester
Ivy, Horace K. ..... Rochester
§ Jackman, Raymond J. ..... Rochester
Janes, Joseph M. ..... Rochester
Johnson, Adelaide, McF. ..... Rochester
§ Johnson, Carl E. ..... Rochester
§ Johnson, Einer W., Jr. ..... Rochester
§ Johnson, Ralph B. ..... Lanesboro
§ Johnson, Victor ..... Rochester
Joyce, George L. ..... Rochester
§ Judd, Edward S. ..... Rochester
§ Juergens, John L. ..... Rochester
† Kaye, L. Ronald ..... Rochester
§ Kearns, Thomas P. ..... Rochester
§ Keating, Francis R., Jr. ..... Rochester
Keith, Haddow M. ..... Rochester
†§ Keith, Norman M. ..... Rochester
Kelley, Maurice L., Sr. ..... Rochester
§ Kelly, Patrick J. ..... Rochester
§ Kennedy, Roger L. J. ..... Rochester
§ Kernohan, James W. ..... Rochester
§ Kiely, Joseph M. ..... Rochester
§ Kierland, Robert R. ..... Rochester
† Kim, Robert ..... Rochester
§ Kincaid, Owings W. ..... Rochester
King, Harold E. ..... Rochester
† Kinzel, Raymond C. ..... Rochester
§ Kirby, Thomas J., Jr. ..... Rochester
§ Kirklin, John W. ..... Rochester
‡ Kirshen, Robert ..... Rochester

Klass, Donald W. ..... Rochester
§ Knutson, Lewis A. ..... Spring Grove
§ Koelsche, Giles A. ..... Rochester
† Kohn, Eleanor M. ..... Rochester
Kragh, Lyle V. ..... Rochester
§ Krusen, Frank H. ..... Rochester
§ Kvale, Walter F. ..... Rochester
Kyle, Robert A. ..... Rochester
§ Lake, Clifford F. ..... Rochester
‡ Lansche, Richard K. ..... Rochester
Larson, Norman E. ..... Rochester
Larson, Robert L. ..... Rochester
§ Lazarte, Jorge A. ..... Rochester
† Lee, Robert E. ..... Rochester
† Leigh, John E. ..... Rochester
Lewis, David R. ..... Rochester
† Lidsky, Martin D. ..... Rochester
§ Lillie, John C. ..... Rochester
Lipscomb, Paul R. ..... Rochester
† Lipson, Richard L. ..... Rochester
Litin, Edward M. ..... Rochester
§ Litzow, Thaddeus J. ..... Rochester
Lofgren, Karl A. ..... Rochester
Logan, George B. ..... Rochester
† Lorence, Ernest ..... Rochester
§ Love, J. Grafton ..... Rochester
§ Lundy, John S. ..... Rochester
Lyons, William S. ..... Douglas
§ MacCarty, Collin S. ..... Rochester
§ MacCarty, William C. ..... Rochester
Magath, Thomas B. ..... Rochester
† Magee, Charles J. ..... Rochester
Maher, Frank T. ..... Rochester
Maks, Stephen W. ..... Rochester
‡ Malkasian, George D., Jr. .....
North Chicago, Ill.
§ Mankin, Harold T. ..... Rochester
§ Martens, Theodore G. ..... Rochester
§ Martin, Gordon M. ..... Rochester
§ Martin, John T. ..... Rochester
§ Martin, Maurice J. ..... San Juan, Porto Rico
§ Martin, William J. ..... Rochester
Masson, Duncan M. ..... Rochester
§† Masson, James C. ..... Rochester
§ Masson, James K. ..... Rochester
Mastman, Gary J. ..... Rochester
Mathieson, Don R. ..... Rochester
Mayberry, William E. ..... Rochester
† Maytum, W. James ..... Rochester
§ Mayne, John G. ..... Rochester
§ Mayo, Charles W. ..... Rochester
McAllister, James ..... Rochester
§ McBean, James B. ..... Rochester
McCaslin, Frank E., Jr. ..... Rochester
§ McConahey, William M., Jr. ..... Rochester
McDonald, Colin C. ..... Rochester
§ McGoon, Dwight C. ..... Rochester
McIlhany, Mary Lou ..... Latana, Florida
McMahan, Robert O. ..... Rochester
§ Merritt, Wallace A. ..... Rochester
† Meyerding, Henry W. ..... Rochester
† Meyer, Vernon Wm. ..... Rochester
† Michener, Wm. M. ..... Rochester
† Miller, Archie W. ..... Rochester
§ Miller, Roland D. ..... Rochester
§ Miller, Ross H. ..... Rochester
§ Millikan, Clark H. ..... Rochester
§ Mills, Stephen D. ..... Rochester
†§ Moersch, Frederick P. .....
Fort Lauderdale, Florida
§ Moersch, Herman J. ..... Rochester
§ Moertel, Charles G. ..... Rochester
§ Molnar, George D. ..... Rochester
§ Montgomery, Hamilton ..... Rochester
Morisaki, Michael M. ..... Rochester
§ Morlock, Carl G. ..... Rochester
§ Morrow, George W., Jr. ..... Rochester
Moskowitz, Roland W. ..... Rochester
§ Mulder, Donald W. ..... Rochester
† Murphy, Frank P. ..... Rochester
Mussey, Mary E. ..... Rochester
§ Myers, Thomas T. ..... Rochester
Nehring, Jesse P. ..... Preston
† Nelson, Jerald C. ..... Rochester
§ Nichols, Donald R. ..... Rochester
Niehaus, Karl F. ..... Rochester
Nolan, Robert B. ..... Rochester
Norris, Neil T. ..... Caledonia
Nostrom, Craig W. ..... Rochester
§† Odel, Howard M. ..... Rochester
Okihiro, Michael M. ..... Rochester
§ Olsen, Arthur M. ..... Rochester
§ Olson, Ernest A. ..... Pine Island
Olson, Grant E. ..... West Concord
Onsgard, L. Kenneth ..... Houston
Osmundson, Philip J. ..... Rochester
Overton, Dolphin H., Jr. ..... Rochester
§ Owen, Charles A., Jr. ..... Rochester
† Ownbey, Richard P. ..... Rochester
† Papp, Andrew ..... Rochester
§ Paris, Jaime ..... Rochester
*§ Parker, Harry L. ..... Rochester
§ Parker, Robert L. ..... Rochester
Parkhill, Edith M. ..... Rochester
§ Parkin, Thomas W. ..... Rochester
Parr, Eugene Q. ..... Rochester
Pascuzzi, Chris A. ..... Rochester
§ Patrick, Robert T. ..... Rochester
§ Paulson, John A. ..... Rochester
Payne, William S. ..... Rochester
Pease, Gertrude L. ....Kansas City, Kansas
§† Pemberton, John de J. ....Palo Alto, Calif.
Perry, Harold ..... Rochester
§ Peters, Gustavus A. ..... Rochester
§ Petersen, Magnus C. ..... Rochester
§ Peterson, Lowell F. A. ..... Rochester
‡ Pettet, John R. .....N. Hollywood, Calif.
Phillips, William McL. ..... Rochester
Piper, Charles I., Jr. ..... Rochester
† Piper, Monte C. .....Lacanada, Calif.
Plum, George E. ..... Rochester
§ Polley, Howard F. ..... Rochester
§ Pool, Thomas L. ..... Rochester
Posey, John W. ..... Rochester
§ Pratt, Joseph Hyde, Jr. ..... Rochester
§ Prickman, Louis E. ..... Rochester
§ Priestley, James T. ..... Rochester
§ Pruitt, Raymond D. ..... Rochester
§ Pugh, David G. ..... Rochester
§ Purnell, Don C. ..... Rochester
Quetsch, Richard M. ..... Rochester
Ragen, Patrick A. .....Seattle, Washington
§ Ralston, Donald E. ..... Rochester
Ramsdell, John Alan ..... Rochester
§ Randall, Lawrence M. ..... Rochester
§ Randall, Raymond V. ..... Rochester
§ Reitemeier, Richard J. ..... Rochester
§ ReMine, William H., Jr. ..... Rochester
Restall, Charles J. ..... Rochester
† Reuland, John J. ..... Rochester
‡ Reynolds, William A. .....New York, N. Y.
Rhoads, Donald V. ..... Rochester
§ Risser, Alden F. ..... Stewartville
† Rivers, Morris H. ..... Rochester
Roberts, Frank E. ..... unknown
Rodling, Herbert ..... Rochester
§ Rogne, William G. ..... Spring Grove
§ Rome, Howard P. ..... Rochester
§ Rooke, Edward D. ..... Rochester
Ross, James V. ..... Rochester
Ross, Margaret ..... Rochester
‡ Roth, Harry Leo ..... Rochester
§ Rovelstad, Randolph A. ..... Rochester
† Rowland, Spencer A. ..... Rochester
§ Rucker, Charles W. ..... Rochester
Rushing, Lige B., Jr. ..... Rochester
§ Rushton, Joseph G. ..... Rochester
Russell, Marion F., Jr. ..... Rochester
§ Rynearson, Edward H. ..... Rochester
Sager, Stanley M. ..... Rochester
§ Salassa, Robert M. ..... Rochester
Sanchez, James J. ..... Rochester
*† Sanford, Arthur H. ..... Rochester
† Sasano, Joseph R., Jr. ..... Rochester
§ Sauer, William G. ..... Rochester
Sayre, George P. ..... Rochester
§ Scanlon, Paul W. ..... Rochester
Schaefer, Joseph C. ..... Rochester
§ Scheifley, Charles H. ..... Rochester
Schirger, Alexander ..... Rochester
§ Schmidt, Herbert W. ..... Rochester
§ Scholz, Donald A. ..... Rochester
Schwartz, John T. ..... Rochester
Scott-Miller, James R. ..... Rochester
§ Scudamore, Harold H. ..... Rochester
Seay, James Elbert, III. ..... Rochester
‡ Sebrechts, Paul .....Great Lakes, Illinois
§ Seldon, Thomas H. ..... Rochester
Semler, Herbert J. ..... Rochester
† Sherrick, Donald W. .....Fort Ord, Calif.
§ Shick, Richard M. ..... Rochester
§ Siekert, Robert G. ..... Rochester
Silver, Arthur W. ..... Rochester
Silverstein, Murray N. ..... Rochester
‡ Silvis, Stephen E. .....San Francisco, Calif.
§ Simonton, Kinsey M. ..... Rochester
§ Skaug, Harold M. ..... Chatfield
§ Slocumb, Charles H. ..... Rochester
†§ Smith, Frederick L. ..... Rochester
† Smith, Harry L. ..... Rochester
† Smith, John H. .....Augusta, Georgia
§ Smith, Lucian A. ..... Rochester
§ Smith, Ralph E. ..... Rochester
Smith, Reginald A. ..... Rochester
§ Smith, William G. ..... Rochester
Sommerville, Robert L. ..... Rochester
† Sones, Donald A. ..... Rochester
§ Soule, Edward H. ..... Rochester
Sounders, John C. ..... Rochester
§ Spittel, John A., Jr. ..... Rochester
§ Sprague, Randall G. ..... Rochester
† Spurgeon, Frederick C. ..... Rochester
§ Stauffer, Maurice H. ..... Rochester
§ Steinhilber, Richard M. ..... Rochester
§ Stickney, J. Minott ..... Rochester
§ Stillwell, George K. ..... Rochester
Stilwell, George G. ..... Rochester
Stoltze, Cynthia A. ..... Rochester
Stool, Newsom ..... Rochester
Stormont, James R. ..... Rochester
§ Stroebel, Charles F. Jr. ..... Rochester
§ Sullivan, Charles R. ..... Rochester
§ Svien, Hendrik J. ..... Rochester
† Swedlund, Harry A. ..... Rochester
§ Symmonds, Richards E. ..... Rochester
† Tama, Lawrence ..... Rochester
Taswell, Howard F. ..... Rochester
† Taylor, Lawrence ..... Rochester
§ Tauxe, Welby N. ..... Rochester
Thomas, Juergen E. ..... Rochester
§ Thompson, Gershom J. ..... Rochester
Thompson, John W., III ..... Rochester
† Thurber, Deloron ..... Rochester
§ Tillisch, Jan H. ..... Rochester
‡ Tuffanelli, Denny L. ..... Rochester
§ Uihlein, Alfred ..... Rochester
§ Underdahl, Laurentius O. ..... Rochester
† Urban, F. Henry ..... Rochester
§ Utz, David C. ..... Rochester
Utz, Philip H. .....La Crescent
§ Van Herik, Martin ..... Rochester
§ Vaughn, Louis D. ..... Rochester
§ Verby, John E., Jr. ..... Rochester
Virnig, Hildegard J. .....Caledonia
† Von Heimburg, Roger L. ..... Rochester
†§ Wagener, Henry P. ..... Rochester
Wagoner, James M. .....Harmony
§ Wakefield, Elmer G. ..... Rochester
†§ Wakim, Khalil G. ..... Rochester
§ Waldmann, Edward B. ..... Rochester
§ Walters, Waltman ..... Rochester
§ Ward, Louis E. ..... Rochester
Warvel, John H., Jr. ..... Rochester
Watkins, Charles H. ..... Rochester
§ Watson, John R. ..... Rochester
§ Waugh, John M. ..... Rochester
† Weaver, Walt F. ..... Rochester
† Webb, Robert B., Jr. ..... Rochester
§ Weed, Lyle A. ..... Rochester
§ Weeks, Richard E. ..... Rochester
§ Weidman, William H. ..... Rochester
†§ Weir, James F. ..... Rochester
Welch, Herbert C. ..... Rochester
§ Welch, John S. ..... Rochester
§ Wellman, William E. ..... Rochester
Wellner, Theodore O. ..... Rochester
§ Wente, Harold A. ..... Rochester
† Westlin, William F., Jr. ..... Rochester
Westrup, John E. .....Lanesboro
§ Weyhrauch, William R. ..... Rochester
§ Whisnant, Jack P. ..... Rochester
Whitcomb, Fred F., Jr. ..... Rochester
† White, James C. ..... Rochester
White, Robert J. ..... Rochester
Wilbur, Dwight Locke, III ..... Rochester
† Wilder, Russell M. ..... Rochester
§ Williams, Henry L., Jr. ..... Rochester
Wilson, Paul F. ..... Rochester
§ Wilson, Robert B. ..... Rochester
§ Wilson, Viktor O. ..... Rochester
§ Winkelmann, Richard K. ..... Rochester
‡ Winter, Malcolm D., Jr. .....
Ellsworth A.F.B., South Dakota
Wise, James K. ..... Rochester
† Witten, David M. ..... Rochester
§ Wollaeger, Eric E. ..... Rochester
†§ Woltmann, Henry W. ..... Rochester
Wood, Lloyd T. ..... Rochester
Woodington, Geo. F. ..... Rochester
§ Woolner, Lewis B. ..... Rochester
† Worlton, James T. ..... Rochester
Worthington, John W., Jr. ..... Rochester
† Wry, Paul E. ..... Rochester
§ Yoss, Robert E. ..... Rochester
§ Young, Henry H. ..... Rochester
Zeleny, Joseph H. ..... Rochester
Zimmer, Roy W., Jr. ..... Rochester

Alphabetic Roster

Key to Symbols:
†Affiliate, Resident, Life or Associate Members; ‡Military Service; *Deceased; ¶Honorary

† Aanes, Almer M. ..... Red Wing
Aaro, Leonard A. ..... Rochester
Abraham, Arden L. ..... Duluth
Abrams, Alexander, Jr. ..... St. Paul
Abramson, Milton ..... Minneapolis
Abullarade, Jose A ..... Minneapolis
Achor, Richard W. P. ..... Rochester
Adair, Albert F., Jr. ..... St. Paul
† Adams, Bertram S. ..... Hibbing
Adams, Harold R. ..... St. Paul
† Adams, Ralph E. ..... Rochester
† Addison, Robert M. ..... Rochester
Addy, Edward R. ..... Gilbert
Adkins, Charles D. ..... Minneapolis
Adkins, Galen H. ..... Sandstone
Adkins, James T. ..... Bertha
Adson, Martin A. ..... Rochester
Affeldt, Daniel E. ..... Kasson
Aga, John H. ..... Brainerd
† Ager, Ernest A. ..... Minneapolis
Agustsson, Hreidar ..... Minneapolis
Ahern, Eugene E. ..... Minneapolis
Ahern, Gene J. ..... Red Wing
Ahlfs, Jacob J. ..... Caledonia
Ahlstrom, Robert C. ..... Braham
Ahola, Kenneth E. ..... Hibbing
† Ahrens, Albert E. ..... St. Paul
Ahrens, Curtis F. ..... Duluth
Ahrens, Robert M. ..... St. Paul
Aigner, B. Robert ..... Rochester
Akins, Willard M. ..... Red Wing
Alari, Heine ..... Minneapolis
Albrecht, H. H. ..... Lindstrom
Alcorn, William J. ..... Wabasso
Alden, John F., Jr. ..... St. Paul
Alden, W. Charles ..... Kimball
Alexander, Harlan A. ..... Minneapolis
Aling, Charles A. ..... Minneapolis
† Allaman, Loren E. ..... Rochester
Allen, Edgar V. N. ..... Rochester
Allison, David D. ..... Litchfield
Alpert, Abraham E. ..... Virginia
† Altnow, Hugo O. ..... Coral Gables 34, Florida
Alton, Donald G. ..... St. Paul
Amatuzio, Donald S. ..... Minneapolis
† Amberg, Samuel ..... Rochester
Ambrus, Laszlo ..... St. Paul
Amerongen, W. W. ..... St. Paul
Anderegg, Alfred F. ..... Minneapolis
Andersen, Howard A. ..... Rochester
* Andersen, Silas C. ..... Mineapolis
Anderson, Arden O. ..... Brainerd
Anderson, Arnold S. ..... St. Louis Park
Anderson, Chester A. ..... Hector
Anderson, Chester A. ..... Madison
Anderson, David M. ..... St. Louis Park
Anderson, David P., Jr. ..... Austin
† Anderson, Edward D. ..... Gstaad, Switzerland
Anderson, Ernest R. ..... Minneapolis
Anderson, Frank J. ..... Minneapolis
Anderson, Franklin C. ..... Owatonna
Anderson, Harold J. ..... Austin
Anderson, James J. ..... Mankato
Anderson, John A. ..... Minneapolis
Anderson, John W. ..... Blue Earth
Anderson, Karl W. ..... Minneapolis
Anderson, Margaret C. ..... Mankato
Anderson, Mark J. ..... Rochester
Anderson, Markham J., Jr. ..... Rochester
Anderson, Milton W. ..... Rochester
† Anderson, Richard E. ..... Willmar
Anderson, Richard W. ..... Minneapolis
Anderson, Richard W. ..... Aurora
Anderson, Roger L. ..... Minneapolis
Anderson, U. Schuyler ..... Minneapolis
Anderson, Waldo P. ..... Buffalo
Anderson, Wallace E. ..... Clearbrook
Anderson, Wallace E. ..... Minneapolis
Anderson, Wallace R. ..... Austin
Anderson, Werner W. ..... Brainerd
Anderson, William H. ..... Minneapolis
Anderson, William T. ..... Minneapolis
† Andreassen, Einar C. ..... Minneapolis
Andreassen, Rolf L. ..... Minneapolis
Andresen, Karl d'A ..... Minneapolis
Andrews, Robert S. ..... Minneapolis
† Andrews, Roy N. ..... Mankato
† Angelos, S. Peter ..... Rochester
Ankner, Frank J. ..... Minneapolis
Anonsen, Richard E. ..... Minneapolis
Ansell, Julian S. ..... Minneapolis
Antonow, Arthur M. ..... Virginia
‡ Anzel, Sanford H. ..... Rochester
† Arends, Archabald L. ..... Minneapolis
Arey, S. Lane ..... Minneapolis
Arhelger, Stuart W. ..... Minneapolis
Arlander, Clarence E. ..... Minneapolis
Arling, Leonard S. ..... Minneapolis
Arms, James J. ..... Minneapolis
Armstrong, Byron H ..... Hopkins
Armstrong, Ralph S. ..... Winnebago
Arndt, Harry W. ..... Detroit Lakes
Arnesen, John F. ..... Owatonna
Arneson, Arthur I. ..... Morris
Arnold, Ann W. ..... Minneapolis
Arnold, Elmer W. ..... Adrian
Arnold, John W. ..... Rochester
Arnquist, Andrew S. ..... St. Paul
Arny, Frederick P. ..... St. Paul
Arvidson, Carl G. ..... Minneapolis
Arzt, Philip K. ..... St. Paul
Asta, Joseph J. ..... Duluth
Athens, Alvin G. ..... Duluth
Atmore, William G. ..... Duluth
Aufderheide, Arthur C. ..... Duluth
Aulick, Ernest J. ..... Paynesville
Aurelius, J. Richards ..... St. Paul
Ausman, Duane R. ..... St. Paul
Austraian, Sol ..... St. Paul
Autrey, William A. ..... St. Cloud
Azad, A. M. ..... Minneapolis

Baars, Conrad W. ..... Rochester
Babb, Frank Shaleen ..... St. Paul
Backus, Byron C. ..... Cloquet
Backus, Reno W. ..... Nopeming
Badeaux, George I. ..... Brainerd
Bader, J. L. ..... Slayton
Baer, Walter ..... St. Paul
Baggenstoss, Archie H. ..... Rochester
Baggenstoss, Osmond J. ..... Minneapolis
Bagley, Charles M. ..... Duluth
Bagley, Elizabeth C. ..... Duluth
Bagley, Russell W. ..... Minneapolis
† Bagley, William R. ..... Duluth
Baich, Velemir M. ..... Coleraine
Bair, Hugo L. ..... Rochester
Baird, Joe W. ..... Minneapolis
Baird, Raymond L. ..... St. Paul
¶ Bajec, Dusan ..... Belgrade, Yugoslavia
Baken, Melvin P. ..... Minneapolis
Baken, Melvin P., Jr. ..... Minneapolis
Baker, Abe B. ..... Minneapolis
† Baker, Alfred T. ..... Minneapolis
Baker, George S. ..... Rochester
† Baker, Harry R. ..... Hayfield
Baker, Hillier L., Jr. ..... Rochester
Baker, Jeannette L. ..... Fergus Falls
Baker, Milton E. ..... Minneapolis
Baker, Norman H. ..... Fergus Falls
Bakke, Arnold C. ..... Minneapolis
Bakkila, Henry E. ..... Duluth
Balcome, Milton M. ..... St. Paul
Baleisis, Peter ..... Minneapolis
† Balfour, Donald C. ..... Rochester
Balkin, Samuel G. ..... Minneapolis
Balmer, Albert I. ..... Duluth
Balogh, Charles J. ..... Minneapolis
Bank, Harry E. ..... Minneapolis
Banner, Edward A. ..... Rochester
Barber, Tracy E. ..... Austin
Bardon, Richard ..... Duluth
Bargen, J. Arnold ..... Rochester
Barker, John D. ..... Duluth
† Barker, Nelson W. ..... Rochester
† Barnes, Arlie R. ..... Rochester
Barnes, Richard E. ..... Aurora
Barnett, Joseph M. ..... St. Paul
Barnett, Robert M. ..... Minneapolis
† Barney, Leon A. ..... Duluth
Barno, Alex ..... St. Louis Park
Barr, James S. ..... Elmore
Barr, Lowell C. ..... Albert Lea
Barr, Maxwell M. ..... Minneapolis
Barr, Robert N. ..... Minneapolis
Barr, Ronald W. ..... Montevideo
Barrett, Earl E. ..... Duluth
Barron, Jesse J. ..... Minneapolis
† Barron, Moses ..... Minneapolis
Barron, S. Steven ..... Minneapolis
Barry, Maurice J., Jr. ..... Rochester
† Barsness, Nellie O. N. ..... St. Paul
Bartholomew, Lloyd G. ..... Rochester
Bartness, John ..... Albert Lea
Bartzen, Peter J. ..... Duluth
Basinger, Harold P. ..... Windom
Basinger, Homer P. ..... Windom
Bastron, James A. ..... Rochester
Bateman, Clarence V. ..... Breckenridge
Batdorf, B. Niles ..... Mankato
Battaglino, John J., Jr. ..... Rochester
† Battaile, William G. ..... Rochester
Bauer, Eugene L. ..... St. Paul
Baumgartner, Florian H. ..... Albany
Bayley, E. Covell ..... Lake City
Bayrd, Edwin D. ..... Rochester
Beach, Northrop ..... Minneapolis
Beahrs, Oliver H. ..... Rochester
† Beals, Hugh ..... LaJolla, Calif.
Bean, Charles N. ..... Waconia
Beaton, J. Gordon ..... Northfield
Beck, Charles J. ..... North St. Paul
† Beck, Richard L. ..... Rochester
† Becker, Arnetta M. ..... Unknown
Becker, Frederick T. ..... Duluth
Beckering, Gerrit ..... Edgerton
Bedford, Edgar W. ..... Minneapolis
Beech, Raymond H. ..... St. Paul
Beek, Harvey O. ..... St. Paul
Beer, John J. ..... St. Paul
† Beetham, William P., Jr. ..... Rochester
Behmler, Frederick Wm. ..... Morris
Behr, Orlo K. ..... Crookston
Beirstein, Samuel ..... Minneapolis
Beiswanger, Richard H. ..... Minneapolis
Belcher, Royden A. ..... Little Falls
Bell, Curry ..... St. Paul
Bell, Donald C. ..... Minneapolis
† Bell, Elexious T. ..... Minneapolis
Bell, Harry M., Jr. ..... Duluth
Bellomo, James ..... St. Paul
Bellomo, John ..... Fairmont
Bellville, Titus P. ..... Minneapolis
Belzer, Meyer S. ..... Minneapolis
Bender, James H. ..... Brainerd
Bendix, Lester H. ..... Annandale
† Benedict, William L. ..... Rochester
Benell, Otto E. ..... Virginia
Benepe, James L. ..... St. Paul
Benesh, Louis A. ..... Minneapolis
Benjamin, Edwin G. ..... Minneapolis
Benjamin, Harold G. ..... Minneapolis
Benjamin, Robert B. ..... Minneapolis
Benjamin, Walter G. ..... Pipestone
Benson, Alfred H. ..... Little Falls
Benthack, Elaine M. ..... St. Paul
Bepko, Marie K. ..... Cloquet
Berdez, George L. ..... Duluth
Berg, Arnold M. ..... Roseau
Berg, Clinton C. ..... Wayzata
† Bergan, Otto ..... Clinton
Bergan, Robert O. ..... Duluth
Berge, David O. ..... Roseau
Berge, Harry L. ..... Mora
Berge, Kenneth G. ..... Rochester
Berger, Alex G. ..... Minneapolis
Bergh, George S. ..... Minneapolis
Bergh, Solveig M. ..... Minneapolis
Berglund, Alvin E. ..... Cambridge
Berglund, Eldon B. ..... Minneapolis
Bergman, Oscar B. ..... St. James
Bergquist, James R. ..... Minneapolis
Berkman, John M. ..... Rochester
Berkwitz, Nathaniel J. ..... Minneapolis
† Beringer, E. Duane ..... Rochester
Berman, Harold J. ..... Rochester
† Berman, Irwin B. ..... Rochester
Berman, Reuben ..... Minneapolis
Berman, Stanley ..... Rochester
Bernatz, Philip E. ..... Rochester
Bernhisel, Harris G. ..... St. Paul
Bernier, Merrill J. ..... North St. Paul
Bernstein, Irving C. ..... Minneapolis
Bernstein, William C. ..... St. Paul
Berris, Harold ..... Minneapolis
Bessesen, Alfred N., Jr. ..... Minneapolis
Beuning, John B. ..... St. Cloud
Bevis, William D. ..... Minneapolis
Bianco, Anthony J. ..... Duluth
Bianco, Anthony J., Jr. ..... Rochester
Bicek, Joseph F. ..... St. Paul
Bickel, William H. ..... Rochester
† Biedermann, Jacob ..... Austin
Bieter, Raymond N ..... Minneapolis
† Bigelow, Charles E. ..... Dodge Center

† Bigg, Richard L. ..... Rochester
Bigler, Earl E. ..... Perham
Bigler, Ivan E. ..... Perham
Bilka, Paul J. ..... Minneapolis
Billing, Harry H. ..... Red Wing
Billings, Ralph E. ..... Franklin
Billingsley, John S. ..... Rochester
Binder, Manuel R. ..... Minneapolis
† Binet, Henry E. ..... Grand Rapids
Binkham, George C. ..... Chaska
† Binger, Henry E. ..... Phoenix, Arizona
Bissinger, Lester L. ..... Brainerd
Bittick, Wilbur H. ..... Minneapolis
Bjornson, Robert G. B. ..... Minneapolis
Black, B. Marden ..... Rochester
Black, Earl J. ..... St. Paul
Black, William A. ..... New Ulm
Blackburn, Charles M. ..... Rochester
Blackburn, Henry W., Jr. ..... St. Paul
Blackmore, Sidney C. ..... Biwabik
Blake, Allan J. ..... Hopkins
Blake, James A. ..... Hopkins
Blake, Paul S. ..... Hopkins
† Blakey, Adam R. ..... Osakis
† Bledsoe, Francis H. ..... Rochester
Bloedel, Traugott J. ..... Osseo
Blomberg, Robert D. ..... Minneapolis
Blomberg, Wm. R. ..... St. Paul
Bloom, David ..... Minneapolis
Bloom, Joseph ..... Silver Bay
Bloom, Norman B. ..... Minneapolis
Blumberg, Henry B. ..... St. Paul
Blumenthal, Jacob S. ..... Minneapolis
Boardman, Dalmon V. ..... Winona
† Bock, Rolland A. ..... St. Paul
Boehrer, John J. ..... Minneapolis
Bofenkamp, Benjamin ..... Minneapolis
Bofenkamp, Ferdinand Wm. ..... Luverne
Bohn, Donald G. ..... Minneapolis
Boies, Lawrence R. ..... Minneapolis
Boline, Clifford A. ..... Battle Lake
† Bolsta, Charles ..... Ortonville
Bolstad, Owen C. ..... Little Falls
Bolz, J. Arnold ..... Grand Rapids
Boman, Paul G. ..... Duluth
Bonello, Frank J. ..... St. Paul
Bonner, John L. ..... Eveleth
Boody, George, Jr. ..... Sandstone
Boolukos, George P. N. ..... Rochester
Boone, Ervin S. ..... Luverne
† Booth, Albert E. ..... Minneapolis
† Boreen, Clifton A. ..... Minneapolis
Borg, Joseph F. ..... St. Paul
Borgerson, Arthur H. ..... Long Prairie
† Borgeson, Egbert J. ..... St. Paul
Borman, Chauncey N. ..... Minneapolis
Boroson, Hugh N. ..... Thief River Falls
Borowicz, Leonard A. ..... Minneapolis
Bosland, Howard G. ..... Willmar
† Bossert, Clarence S. ..... Mora
‡ Boswell, J. Thornton ..... Kenosha, Wis.
† Botticelli, Max G. ..... Rochester
Bottolfson, Bottolf T. ..... Moorhead
† Bouma, Lewis R. ..... St. Paul
Bouquet, Bertram J. ..... Wabasha
Bouthilet, Florence J. ..... St. Paul
Bowen, Ralph, Jr. ..... Rochester
Bowen, Robert L. ..... Hibbing
Bowers, Gordon G. ..... Minneapolis
Bowers, Robert N. ..... Lake City
Boyd, David A., Jr. ..... Rochester
Boyd, Frank E. ..... Jasper
Boyer, George S. ..... Crookston
Boyer, Samuel H., Jr. ..... Duluth
Boyle, Francis J. ..... Springfield
Boynton, Ruth E. ..... Minneapolis
Boysen, Herbert ..... Madelia
† Bozanich, Milosh S. ..... Rochester
† Braasch, William F. ..... Rochester
Brabec, Paul F. ..... Hastings
Bradley, Jeanne B. ..... Minneapolis
Bradley, John G. ..... Minneapolis
Bradley, Nelson J. ..... Willmar
* Brand, George D. ..... St. Paul
† Brand, William A. ..... Redwood Falls
Brandenburg, Robert O. ..... Rochester
Brandt, Henry E. ..... Minneapolis
† Branham, Donald S. ..... Dear Park, Wis.
Brannick, Thomas ..... Rochester
Bratholdt, James W. ..... Watertown
† Bratrud, Arthur F. ..... Minneapolis
† Bratrud, Edward ..... Thief River Falls
Bratrude, Earl J. ..... St. James
Braun, Ohrmundt Carl ..... Grand Rapids
Bravick, Donald D. ..... Minneapolis
† Bray, Elwyn R. ..... St. Paul
Bray, Philip N. ..... Duluth
Breitenbucher, Robert B. ..... Minneapolis
Brekke, Harvey J. ..... Minneapolis
† Breslin, Donald J. ..... Rochester
Bretzke, Carl O. ..... Hutchinson
Bridge, Allyn G. ..... Minneapolis
Briggs, John F. ..... St. Paul
Brigham, Charles Fay, Jr. ..... St. Cloud
Brill, Alice K. ..... Minneapolis
Brink, Adlai A. ..... Baudette
Brink, Donald M. ..... Hutchinson
Broadbent, James C. ..... Rochester
Broadie, Thomas E. ..... St. Paul
Brockway, Roger W. ..... Grand Rapids
Brodhun, John C. ..... Rochester
Brodie, Walter D. ..... St. Paul
Broker, Henry M. ..... St. Cloud
† Brooker, Warren J. ..... Minneapolis
† Brooks, Charles N. ..... Minneapolis
Brow, Raymond E. ..... Rochester
Brown, Alexander E. ..... Rochester
Brown, Cyrus G., Jr. ..... Duluth
† Brown, Edgar D. ..... St. Petersburg, Fla.
Brown, Henry A. ..... Rochester
Brown, Ian A. ..... St. Paul
Brown, James E., Jr. ..... St. Paul
Brown, Joe R. ..... Rochester
† Brown, John C. ..... Los Gatos, Calif.
Brown, Philip W. ..... Rochester
† Brown, Robert C. ..... Rochester
Brown, Russell T. ..... Browerville
Brown, William D. ..... Minneapolis
Bruhl, Heinz H. ..... Faribault
Brunsting, Louis A. ..... Rochester
Brusegard, James F. ..... Red Wing
Bucher, Foster D. ..... Starbuck
Buchstein, Harold F. ..... Minneapolis
† Buck, Frederick H. ..... Shakopee
Buckley, J. J. ..... Minneapolis
Buckley, Robert P. ..... Duluth
Buesgens, Ralph H. ..... Waterville
† Buie, Louis A. ..... Rochester
Buie, Louis A., Jr. ..... Rochester
Buirge, Raymond E. ..... Minneapolis
Bulinski, Theodore J. ..... St. Paul
*† Bulkly, Kenneth ..... Minneapolis
Bunker, Bevan W. ..... Anoka
Burch, Edward P., II ..... St. Paul
Burchell, Howard B. ..... Rochester
Buresh, Kenneth L. ..... Unknown
Burgert, E. O., Jr. ..... Rochester
Burich, Harry F. ..... Rochester
Burke, Edmund C. ..... Rochester
Burklund, Edwin C. ..... St. Paul
Burlingame, David A. ..... St. Paul
Burman, Richard E. ..... Aitkin
Burmeister, Richard O. ..... St. Paul
Burnett, Joseph W. ..... New Ulm
Burnham, Wesley H. ..... Minneapolis
† Burns, Catherine ..... Excelsior
Burns, Floyd M. ..... Milan
Burns, M. Alpheus ..... Milan
† Burns, Robert M. ..... St. Paul
Burseth, Edgar C. ..... Mora
Burton, Carl G. ..... St. Paul
Buscher, Julius C. ..... St. Cloud
Bush, Robert P. ..... St. Paul
Bushard, Wilfred J. ..... Minneapolis
Busher, Herbert H. ..... St. Paul
Butler, John K. ..... Cloquet
Butt, Hugh R. ..... Rochester
Butturff, Carl R. ..... Freeborn
† Butzer, John A. ..... Mankato
Butzer, John F. ..... Mankato
Buzzelle, Leonard K. ..... Minneapolis
† Bynum, Grover L., Jr. ..... Rochester
Byrne, William J. ..... Chisholm
Cable, Morris L. ..... Minneapolis
Cabot, Clyde M. ..... Minneapolis
Cadman, Norman L. ..... Rochester
Cady, Laurence H. ..... Minneapolis
Cain, Clark L. ..... St. Paul
Cain, James C. ..... Rochester
Cain, James H. ..... Alexandria
Cairns, Robert J. ..... Redwood Falls
† Calhoun, Frank W. ..... Albert Lea
Calin, Stanford H. ..... St. Paul
Callahan, Francis F. ..... St. Paul
Callahan, John A. ..... Rochester
Callan, Joseph A. ..... Virginia
‡ Callewart, Robert A. ..... Minneapolis
† Calverley, John R. ..... Rochester
Cameron, Dale C. ..... St. Paul
Cameron, Isabell L. ..... Minneapolis
Cameron, John H. ..... Crookston
Camp, Ray J. ..... Madison
Campbell, Dennis V. ..... Fergus Falls
Campbell, Donald C. ..... Rochester
† Campbell, Lowell M. ..... Minneapolis
Campbell, Malcolm K. ..... Rochester
Campbell, Orwood J. ..... Minneapolis
Canfield, Wayne W. ..... St. Peter
Canine, James Lee ..... South St. Paul
Cantwell, Wm. F. ..... International Falls
Caplan, Leslie ..... Minneapolis
Card, William H. ..... Minneapolis
Cardle, George E. ..... Brainerd
Carey, James B. ..... Minneapolis
Carey, James B., Jr. ..... Minneapolis
Carlander, Lester W., Jr. ..... Minneapolis
Carley, Walter A. ..... St. Paul
Carlon, Donald L. ..... Willmar
Carlson, Carl E. ..... Alexandria
Carlson, Charles V. ..... Mound
Carlson, Homer J. ..... Pelican Rapids
Carlson, John V. ..... Westbrook
Carlson, Lawrence ..... Minneapolis
Carlson, Leonard T. ..... Minneapolis
‡ Carlson, Robert G. ..... Seattle, Wash.
Carlson, Russel E. ..... Stillwater
Carlson, Vernon J. ..... Moorhead
† Carnevali, John F. ..... Rochester
Caron, Robert P. ..... Minneapolis
Carr, David T. ..... Rochester
Carr, William J. ..... Minneapolis
Carroll, John J. ..... Winsted
Carryer, Haddon M. ..... Rochester
Carthey, Frank J. ..... New Ulm
† Carveth, Stephen W. ..... Rochester
Casey, John J. ..... Ivanhoe
Caspers, Carl G ..... Minneapolis
† Catlin, John J. ..... Buffalo
Catlin, Theodore J. ..... Buffalo
Cauble, Charles F. ..... Minneapolis
† Cavanor, Frank T. ..... Minneapolis
Cedarleaf, Cherry B. ..... Mahtomedi
Ceder, Elmer T. ..... Minneapolis
Cella, Joseph A. ..... Minneapolis
Ceplecha, Stanley F. ..... Redwood Falls
Cervenka, Charles F. ..... New Prague
Cesnik, Robert J. ..... Sauk Rapids
Chadbourn, Charles R. ..... St. Paul
Chadbourn, Wayne A. ..... Minneapolis
Chalgren, William S. ..... Mankato
Challman, Samuel A. ..... Minneapolis
† Chambers, Winslow C. ..... Blue Earth
Chappell, Elliott Rae ..... Stillwater
† Chatterton, Carl C. ..... St. Paul
† Chavez, Demetrio A. ..... St. Paul
Chermak, Francis G. ..... International Falls
Chervenak, William A. ..... Winsted
Chesler, Merrill D. ..... Minneapolis
Child, Sherman B. ..... Minneapolis
Childs, Donald S., Jr. ..... Rochester
Chisholm, Tague C. ..... Minneapolis
Chittum, John R. ..... Aurora
Chrzan, Donald J. ..... Duluth
Christensen, Clarence H. ..... Duluth
Christensen, Eli E. ..... Winona
Christensen, Llewellyn E. ..... Minneapolis
Christensen, Norman A. ..... Rochester
Christiansen, Andrew ..... St. Paul
Christiansen, Harold A. ..... Jackson
Chunn, Stanley S. ..... Willmar
Ciriacy, Edward W. ..... Ely
Clagett, O. Theron ..... Rochester
Clapp, Hubert D. ..... Crookston
Clark, Edward C. ..... Rochester
Clark, Elizabeth A. ..... Duluth
Clark, Harry B. ..... St. Cloud
Clark, Henry B., Jr. ..... Minneapolis
Clark, Ivan T. ..... Duluth
† Clark, Lealand L. ..... Rochester
Clark, Leslie W. ..... Spring Valley
Clark, Malcolm D. ..... Minneapolis
Clark, Robert S. ..... Minneapolis
Clarke, John W. ..... Waconia
Clay, Lyman B. ..... Minneapolis
Cleaves, William D. ..... Sauk Centre
Clifford, George W. ..... Alexandria
† Clifton, Theodore A. ..... Hollywood, Florida
Closuit, Frederick C. ..... Aitkin
‡ Clowdus, Bernard F., II ..... Rochester
Cochrane, Byron B. ..... St. Paul
Cochrane, Ray F. ..... Minneapolis
Coddon, Walter D. ..... St. Paul
† Cody, D. Thane ..... Rochester
Coe, John I. ..... Minneapolis
Coffey, William F. X. ..... Rochester
Cohen, Bernard A. ..... Minneapolis
Cohen, Ellen K. ..... Rochester
Cohen, Ellis N. ..... St. Paul
Cohen, Ephraim B. ..... Minneapolis
Cohen, Henry W. ..... Minneapolis
† Cohen, Hyman L. ..... Rochester
† Cohen, Maynard M. ..... Minneapolis
Cohen, Sumner S. ..... Oak Terrace
Colby, Malcolm Y., Jr. ..... Rochester
Colby, Woodard L. ..... St. Paul
Cole, James S. ..... Minneapolis
Cole, Wallace H. ..... St. Paul
Coleman, John B. ..... St. Paul
Coll, James J. ..... Duluth
† Collie, Henry G. ..... St. Petersburg, Fla.
† Collins, Arthur N. ..... Duluth
† Collins, Joseph S. ..... Wabasha
Colman, Edward L. ..... Fergus Falls
Conley, Francis W. ..... Duluth
Conley, Robert H. ..... Mankato
Connolly, Coleman J. ..... St. Paul
Connolly, Daniel C. ..... Rochester
Connolly, Joseph P. ..... South St. Paul
Connor, Charles E. ..... St. Paul
Connor, P. James ..... Rochester
Cook, C. Kenneth ..... St. Paul

Cook, Edward N. ..... Rochester
Cook, Jay M. ..... Staples
Coombs, Carl H. ..... Cass Lake
Cooper, Charles C. ..... St. Paul
† Cooper, Maurice D. ..... Winnebago
Cooper, Robert R. ..... Minneapolis
Cooper, Talbert ..... Rochester
Cope, Hershel B. ..... Virginia
Corbin, Kendall B. ..... Rochester
Corniea, Albert D. ..... Minneapolis
Corr, William P. ..... Rochester
Correa, Dale H. ..... Minneapolis
Corrigan, Cyril J. ..... Rochester
Cosgriff, James A. ..... Olivia
Cosgriff, James A., Jr. ..... Olivia
‡ Cottone, Francis J. ..... Trenton, N. J.
† Coughlin, Dennis, Jr. ..... Rochester
Coulter, Harold E. ..... Madelia
† Countryman, Roger S. ..... Saratoga, Calif.
Courteau, Robert D. ..... Onamia
Coventry, Markham B. ..... Rochester
Coventry, William D. ..... Duluth
Covey, Kenneth W. ..... Crookston
Cowan, Donald W. ..... Minneapolis
Cowan, George M. ..... Duluth
Craig, David M. ..... St. Paul
Craig, M. Elizabeth ..... Minneapolis
† Craig, Winchell M. ..... Rochester
† Crandall, Earle E. ..... Rochester
† Cranmer, Richard R. ..... Minneapolis
Cranston, Robert W. ..... Minneapolis
Creevy, Charles D. ..... Minneapolis
Cronwell, Bernhard J. ..... Austin
Crook, Rudolph L. ..... Duluth
Crow, Earl Roy ..... Ah-Gwah-Ching, Minn.
Crowley, James H. ..... St. Paul
Crudo, Vincent D. ..... St. Paul
Crump, James W. ..... St. Paul
Culligan, Leo C. ..... Minneapolis
Culp, Ormond S. ..... Rochester
Culver, Lucian G. ..... St. Paul
Cumming, E. Dale ..... St. Paul
Cundy, Donald T. ..... Minneapolis
Curtis, Rauen A. ..... LeCenter
Cushing, Richard T. ..... Minneapolis
‡ Cushing, Robert L. ..... Walnut Creek, Calif.
† Cutts, George ..... Minneapolis

Daehlin, Rolf ..... Fergus Falls
Daggett, Donald R. ..... Minneapolis
Dahl, Diane A. ..... Mahtomedi
Dahl, Elmer O. ..... Minneapolis
Dahl, James C. ..... Minneapolis
Dahl, John A. ..... Minneapolis
Dahlin, David C. ..... Rochester
† Daignault, Oscar ..... Benson
Dale, Lester N. ..... Red Lake Falls
Daly, David ..... Rochester
Danford, Harold G. ..... Appleton, Wis.
† Daniel, Donald H. ..... Minneapolis
† Danielson, Karl A. ..... Litchfield
Danielson, Lennox ..... Litchfield
Danyluk, Michael ..... Minneapolis
Dargay, Cyril P. ..... Minneapolis
Daugherty, Guy W. ..... Rochester
David, Reuben ..... Hopkins
† Davidson, Paul ..... Rochester
Davidson, William D. ..... St. Joseph
Davis, Arthur E., Jr. ..... St. Cloud
† Davis, Austin C. ..... Pampano Beach, Fla.
Davis, Edward V. ..... St. Paul
Davis, George D. ..... Rochester
Davis, Jay C. ..... Minneapolis
Davis, Lloyd T. ..... Wadena
Davis, Luther F. ..... Wadena
Davis, Raymond D. ..... Waseca
Davis, William I. ..... Sandstone
Dawson, James R. ..... St. Paul
Dawson, Lorin D. ..... Worthington
Dearing, Wm. H., Jr. ..... Rochester
Decker, Charles H. ..... St. Paul
Decker, David G. ..... Rochester
Degallier, Daniel ..... Winona
Delmore, John L., Jr. ..... Roseau
del Plaine, Carlos W. ..... Minneapolis
DeMarais, Lloyd C. ..... Hibbing
Demo, Robert A. ..... Albert Lea
Derauf, Benjamin I. ..... St. Paul
Derauf, Donald E. ..... St. Paul
Deters, Donald C. ..... St. Paul
Detjen, Edward D. ..... Bigfork
Deutsch, Robert J. ..... Duluth
Devereaux, Thomas J. ..... Wayzata
Devine, Kenneth D. ..... Rochester
DeWeerd, James H. ..... Rochester
Deweese, Wilford J ..... Bemidji
Dewey, Donald H. ..... Owatonna
Dickman, Roy W. ..... Minneapolis
Dickson, Franklin H., Jr. ..... Duluth
Diefenbach, Eugene J., Jr. ..... Minneapolis
Diehl, Harold S. ..... New York City, N. Y.
Dierker, Heinrich A. ..... Minneapolis

Diessner, Ardell W. ..... Redwood Falls
Diessner, Grant R. ..... Rochester
Diessner, Henry D. ..... Minneapolis
Dille, Donald E. ..... Litchfield
Dillenbrug, C. J. ..... Little Falls
Divertie, Matthew B. ..... Rochester
Dixon, Claude F. ..... Rochester
Doan, Robert English ..... Wayzata
Dobbs, Richard L. ..... Rochester
Dobler, Manfred G. ..... Ely
Dobson, Mervin W. ..... Mankato
Dockerty, Malcolm B. ..... Rochester
Docksey, John W. ..... Willmar
Dodds, William C. ..... Detroit Lakes
Dodson, Albertus F. ..... Brainerd
Doerr, Gerhard M. ..... Minneapolis
Doherty, Elmer M. ..... New Prague
Dokken, James H. ..... Windom
Doman, Victor W. ..... Lakefield
† Dombrowski, Edmund T. ..... Rochester
Doms, Vernon A. ..... Elbow Lake
Donaldson, Charles S. ..... St. Cloud
Donatelie, Edward P. ..... Minneapolis
Donoghue, Francis E. ..... Rochester
Donovan, Daniel L. ..... Albert Lea
Dordal, John ..... Sacred Heart
Dorge, Richard I. ..... Minneapolis
Dorsey, George C. ..... Minneapolis
Dorsey, George C., Jr. ..... Minneapolis
Doscherholmen, Alfred ..... Minneapolis
Douglass, Bruce E. ..... Rochester
Douglass, Jesse E. ..... Cannon Falls
† Doxey, Gilbert L. ..... Minneapolis
Doyle, James R. ..... Rochester
Doyle, Lawrence O. ..... Minneapolis
Drake, Carl B. ..... St. Paul
† Drake, Charles R. ..... Minneapolis
*† Dredge, Homer P. ..... Sandstone
Drexler, George W. ..... Blue Earth
Drill, Herman E. ..... Hopkins
† Drips, Della G. ..... Oronoco
Dry, Thomas J. ..... Cape Town, Africa
† DuBois, Julian F. ..... Sauk Centre
DuBois, Julian F., Jr ..... Sauk Centre
Duff, Edwin R. ..... Minneapolis
Dummer, Donald J. ..... New Brighton
Duncan, James W. ..... Moorhead
*† Dungay, Neil S. ..... Northfield
Dunlap, Earl H. ..... Minneapolis
Dunn, Robert C. ..... St. Paul
Dupont, Joseph A. ..... Excelsior
Duryea, Marbry ..... Minneapolis
Duryea, Willis M. ..... Minneapolis
Duryea, Willis M., Jr. ..... Minneapolis
DuShane, James W. ..... Rochester
Dvorak, Benjamin A. ..... Minneapolis
Dwan, Paul F. ..... Minneapolis
Dworsky, Samuel D. ..... Minneapolis
Dwyer, John J. ..... Duluth
Dyer, John Allen ..... Rochester
Dyrdal, Paul J. ..... St. Paul
Dysterheft, Adolf F. ..... Gaylord

Earl, Geo. A. ..... St. Paul
Earl, John R. ..... St. Paul
* Eaton, Lealdes M. ..... Rochester
Eberley, Tobe S. ..... Benson
† Eberlin, Edward A. ..... Glenwood
Eckdale, John E. ..... Marshall
Eckman, Philip F. ..... Duluth
Eckman, Ralph J. ..... Duluth
† Edelstein, Jack P. ..... Rochester
Eder, Walter P. ..... Minneapolis
Edwards, Jesse E. ..... Rochester
Edwards, Joseph W. ..... St. Paul
Edwards, Lloyd G. ..... St. Paul
Edwards, Robert V. ..... Crookston
Edwards, Thomas J. ..... St. Paul
Edwin, Russell L. ..... Rochester
Egge, Sanford G. ..... Albert Lea
Eginton, Charles T. ..... St. Paul
Ehrenberg, Claude J. ..... Minneapolis
Ehrlich, S. Paul ..... Minneapolis
Eich, Matthew A. ..... Minneapolis
Eichhorn, Edmund P., Jr. ..... Minneapolis
Eide, O. A. ..... Hancock
Eisenman, Walter ..... Hibbing
Eisenstadt, David H. ..... Minneapolis
Eisenstadt, William S. ..... Minneapolis
Eitel, George D. ..... Minneapolis
† Ekblad, John W. ..... Rock Island, Illinois
Eklund, Carl D. ..... Duluth
Ekstrand, Leroy M. ..... Wabasha
Eli, Earl W. ..... Minneapolis
Elias, Frank J. ..... Duluth
Elkins, Earl C. ..... Rochester
Ellertson, Leonard M. ..... Albert Lea
Ellinger, Albert J. ..... Willmar
Elliott, Harold J. ..... Hayfield
Ellis, Earl W. ..... Elgin
Ellis, F. Henry ..... Rochester
Ellison, David E. ..... Minneapolis

Ellison, Ellis ..... Minneapolis
Ellison, Evan S. ..... Minneapolis
Ellison, Frank E. ..... Monticello
Ellwood, Paul M., Jr. ..... Minneapolis
Elrod, Calvin R. ..... Long Lake
† Elsey, James R. ..... Glenwood
Emanuel, Karl W. ..... Duluth
Emerson, Edward C. ..... St. Paul
Emerson, Edwin E. ..... Osakis
Emmett, John L. ..... Rochester
Emmons, R. W. ..... St. Paul
Emond, Albert J ..... Farmington
Emond, Joseph S. ..... Farmington
Endress, Edward K. ..... St. Paul
Engberg, Edward J. ..... Faribault
Engels, Edward P. ..... Rice Lake, Wis.
Engel, Joseph P. ..... Minneapolis
Engelhart, Peter C. ..... Minneapolis
† Engler, Robert S ..... Rochester
Englund, Elvin F. ..... Minneapolis
Englund, Garth W. ..... Mabel
Engstrand, Oscar J. ..... Minneapolis
Engstrom, Robert B. ..... Mankato
Enroth, Oscar E. ..... St. Paul
Engwall, Richard ..... Ivanhoe
Eppard, Raymond M. ..... Cloquet
Erdal, Ove A. ..... Albert Lea
Erich, John B. ..... Rochester
Erickson, Alvin O. ..... Long Prairie
Erickson, Clifford O. ..... Minneapolis
Erickson, Donald J. ..... Rochester
Erickson, Eskil ..... Halstad
Erickson, George P. ..... Hibbing
Erickson, Laurence F. ..... Minneapolis
Erickson, Myron E. ..... Minneapolis
Erickson, Reuben F. ..... Minneapolis
Erickson, Vernon D. ..... Grand Rapids
† Ericson, Swan ..... Los Angeles, Calif.
Erlanson, Andrew C. ..... Minneapolis
† Ernest, George C. H. ..... Lakeland, Fla.
Ersfeld, Murray P. ..... St. Paul
† Erskine, Gordon M. ..... Grand Rapids
Esensten, Sidney ..... Minneapolis
† Eshelby, E. C. ..... St. Paul
‡ Esser, Robert A. ..... Paris, France
Estes, J. Earle, Jr. ..... Rochester
Estrem, Ralph L. ..... Fergus Falls
Estrem, Robert D. ..... Fergus Falls
Etzwiler, Donnell D. ..... Minneapolis
† Eusterman, George B. ..... Rochester
Eustermann, John J. ..... Mankato
Evans, Edward T. ..... Minneapolis
Evans, Leslie M. ..... Sauk Rapids
Evans, Robert D. ..... Minneapolis
† Evarts, Arrah B. ..... Rochester
† Evenson, David J. ..... Rochester
Evensta, John B. ..... Grand Rapids
Ewens, George B. ..... Virginia

Faber, John E. ..... Rochester
† Fahr, George E. ..... Minneapolis
Fairbairn, John F. ..... Rochester
Falk, Abraham ..... St. Paul
Fallon, Virgil T. ..... Dawson
Falls, John L. ..... Red Wing
Fansler, Walter A. ..... Minneapolis
Farkas, John V. ..... St. Paul
Fasbender, Herman T. ..... Hastings
Faucett, Robert L. ..... Rochester
Faulconer, Albert, Jr. ..... Rochester
† Faust, Herbert A. ..... Rochester
Fawcett, Arthur M. ..... Renville
Fawcett, Keith R. ..... Duluth
Fedor, Robert D. ..... Litchfield
Fee, John G. ..... St. Paul
Feeney, John M. ..... Minneapolis
Feigal, David W. ..... Wayzata
Feigal, William M. ..... Fairmont
Feinberg, Philip ..... Minneapolis
Feinberg, Samuel B. ..... Minneapolis
‡ Feinerman, Burton ..... Brooklyn, N. Y.
Feinstein, Julius Y. ..... Minneapolis
Felder, Davitt A. ..... St. Paul
Felion, Arthur J. ..... St. Paul
Fellows, Manley F. ..... Duluth
Fenger, Ejvind P. K. ..... Oak Terrace
Ferguson, William C. ..... Walnut Grove
Ferrand, Paula T. ..... Moose Lake
Ferrell, Clarence R. ..... Grand Rapids
Ferris, Deward O. ..... Rochester
Fesenmaier, Otto B. ..... New Ulm
Fesler, Harold H. ..... St. Paul
Fetzek, Albert D. ..... Austin
Feuling, John C. ..... Duluth
Fidelman, Norman E. ..... Foley
Field, Anthony Hugh ..... Farmington
Field, Charles W. ..... Minneapolis
Fifer, William R. ..... Minneapolis
Fifield, Malcolm M. ..... Duluth
† Figi, Frederick A. ..... Rochester
Fingerman, David L. ..... Minneapolis
Fink, Daniel L. ..... St. Paul

Fink, Leo W. ..... Minneapolis
Fink, Robert J. ..... Minneapolis
Fink, Walter H. ..... Minneapolis
Finkelnburg, William O. ..... Winona
Fisch, Herbert M. ..... Austin
Fischer, John R. ..... Blooming Prairie
Fischer, Mario M. ..... Duluth
Fischer, Robert F. ..... St. Paul
Fisher, Dan W. ..... St. Paul
Fisher, Don H. ..... Minneapolis
Fisher, Isadore I. ..... Minneapolis
Fiskett, Henry ..... Duluth
*†FitzGerald, Don F. ..... Wayzata
Fitzsimons, William E., Jr. ..... Brainerd
† Fjeldstad, Christian A. ..... Minneapolis
Flanagan, Harold F. ..... St. Paul
Flanagan, Leonard G. ..... Austin
Flancher, Leon H. ..... Crookston
Flannery, Hubert F. ..... St. Paul
Flatt, John R. ..... Wabasha
Fleeson, William H. ..... Minneapolis
Fleming, Dean S. ..... Hopkins
† Fleming, Thomas N. ..... St. Cloud
* Flesche, Bernard A. ..... Wabasha
Fliehr, Richard R. ..... Minneapolis
Flink, Edmund B. ..... Minneapolis
Flinn, James B. ..... Redwood Falls
† Flinn, Thomas E. ..... Remer
Floersch, Adrian J. ..... Owatonna
Flom, Reynold P. ..... St. Paul
Florine, Martin C. ..... Janesville
Flynn, Bernard F ..... Hibbing
Flynn, Louis L., Jr. ..... St. Paul
Flynn, Robert A. ..... St. Paul
Foderick, Peter P. ..... Hallock
† Fogarty, Charles W. ..... St. Paul
Fogarty, Charles W., Jr. ..... St. Paul
Fogelberg, Emil J. ..... St. Paul
Foker, Leslie W. ..... Minneapolis
Foley, Frederic E. B. ..... St. Paul
Folken, Frank G. ..... Albert Lea
Folsom, Louis B. ..... Minneapolis
Ford, Burton C. ..... Marshall
Ford, F. Wendell ..... New London
Ford, William H. ..... Minneapolis
Forsythe, James R. ..... St. Paul
Fortier, George M. A. ..... Little Falls
Fortier, Rene G. ..... Mankato
Foss, Edward L. ..... Rochester
Foster, Orley W. ..... Minneapolis
Foulk, William T. ..... Rochester
† Fowler, Lucius H. ..... Newport Beach, Calif.
† Fox, Donald P. ..... Tanganyika, East Africa
Fox, James R. ..... Minneapolis
Fox, LeRoy J. ..... St. Paul
† Franchere, Frederick W. ..... Lake Crystal
Francis, David W. ..... Morristown
† Francis, Robert L. ..... Rochester
Franckowiak, John J. ..... Rochester
Frane, Donald B. ..... Minneapolis
Fredericks, George M. ..... Minneapolis
Frederickson, Alice C. ..... Willmar
Freeman, Charles D., Jr. ..... St. Paul
‡ Freeman, Craig W. ..... Fort McPherson, Ga.
Freeman, Donald W. ..... St. Louis Park
† Freeman, John P. ..... Glenville
French, Bayard T. ..... Hibbing
French, Lyle A. ..... Minneapolis
Frethem, Allen A. ..... Rochester
Frey, Richard J. ..... Minneapolis
Friberg, Joseph B. ..... Minneapolis
Fricke, Robert E. ..... Rochester
Fried, Louis A. ..... Minneapolis
Friedell, Aaron ..... Minneapolis
Friedell, George ..... St. Louis Park
Friedlieb, Oskar P. ..... Minneapolis
Friedman, Harry S. ..... Minneapolis
Fritsche, Albert ..... New Ulm
Fritsche, Carl J. ..... New Ulm
Fritsche, Theodore R. ..... New Ulm
Fritz, Wallace L. ..... St. Paul
Froats, Charles W. ..... St. Paul
Frost, John B. ..... Minneapolis
Frost, Russell H. ..... St. Paul
Frykman, Howard M. ..... Minneapolis
Frys, Russell N. ..... Minneapolis
† Fuller, Alice H. ..... Minneapolis
Fuller, Benjamin F. ..... St. Paul
Fuller, Josiah ..... Duluth
Funk, Victor K. ..... Oak Terrace
Furlow, William L. ..... Faribault
Furman, Lucie C. ..... Minneapolis
Fusaro, Ramon M. ..... Minneapolis

Gaard, Richard C. ..... Minneapolis
Gaebe, Milton B. ..... Clara City
Gaida, Jos. S. ..... St. Cloud
Gailitis, Veronika M. ..... Cambridge
Galeis, Aina ..... Minneapolis
† Gallagher, Bernard J. ..... Waseca
Gallett, Lester E. ..... Minneapolis
Gallgan, John J. ..... St. Paul
† Galligan, Margaret M. ..... Minneapolis
† Gambill, Carl M. ..... Rochester
Gambill, Earl E. ..... Rochester
Gamble, Elbert J. ..... Albert Lea
Gamm, Edgar R. ..... Triumph
Gammell, John H. ..... Minneapolis
† Gannon, Paul G. ..... Rochester
Garamella, Joseph J. ..... Minneapolis
Garbrecht, Arthur W. ..... St. Paul
Gardner, Jack K. ..... Ceylon
Gardner, Victor H., Sr. ..... Fairmont
Gardner, Walter P. ..... St. Paul
Garlock, De Witt H. ..... Highlands, Calif.
Garrow, Douglas M. ..... St. Paul
Garske, George L. ..... Minneapolis
Garten, Joseph L. ..... Minneapolis
Garvey, James T. ..... Minneapolis
Gastineau, Clifford F. ..... Rochester
† Gatzke, Laurence D. ..... Rochester
Gault, N. L., Jr. ..... Minneapolis
† Gault, Sarah Jane ..... Minneapolis
Gaviser, David ..... Minneapolis
Gehlen, Joseph N. ..... St. Paul
Geib, Marvin J. ..... Fargo, North Dakota
Geiser, Peter M. ..... Alexandria
Geller, Joseph ..... Minneapolis
George, Vane P., Jr. ..... Minneapolis
Geraci, Joseph E. ..... Rochester
Geurs, Benjamin R. ..... Mankato
† Ghostley, Mary C. ..... Santa Ana, Calif.
Gibbs, Edward C. ..... St. Paul
Gibbs, Robert W. ..... Minneapolis
Giebenhain, John N. ..... Minneapolis
Giere, Joseph C. ..... Minneapolis
Giere, Richard W. ..... Minneapolis
Giere, Silas W. ..... Benson
Giesbrecht, A. ..... Hallock
† Giffin, Herbert Z. ..... Rochester
Gifford, R. W., Jr. ..... Rock
Gilbertsen, Victor A. ..... Minneapolis
Gilbert, Maurice G. ..... Minneapolis
Giles, William F. ..... Rochester
‡ Gill, Charles R. ..... Ford Mead, Maryland
Gill, Theodore ..... Albert Lea
Gillespie, Delmar R. ..... St. Paul
Gillespie, Malcolm G. ..... Duluth
† Gilloon, James R. ..... Rochester
Gilman, Lloyd C. ..... Willmar
Gilpin, Charles A., Jr. ..... Rochester
Gilsdorf, Donald A. ..... St. Paul
Gingold, Benjamin A. ..... Minneapolis
*†Girvin, Richard B. ..... Minneapolis
Gislason, Paul H. ..... Mankato
Gislason, Solveig T. ..... St. Peter
Gierde, William P. ..... Lake City
Glabe, Robert A. ..... Plainview
Glaeser, John H. ..... Minneapolis
Glathe, John P. ..... Rochester
Gleason, Wallace A. ..... St. Paul
† Glick, Dallas D. ..... Rochester
Glueck, Bernard C., Jr. ..... Minneapolis
Goblirsch, Andrew P. ..... Sleepy Eye
Godfrey, H. Wilson ..... Minneapolis
Goehrs, Gilman H. ..... St. Cloud
† Goehrs, Henry W. ..... St. Cloud
Goering, Emil L. ..... Mountain Lake
Goetz, Frederick C. ..... Minneapolis
Gold, David ..... Minneapolis
Goldberg, Isadore M. ..... Minneapolis
Goldberg, Marvin E. ..... Minneapolis
Goldish, Daniel R. ..... Duluth
Goldish, Robert J. ..... Duluth
Goldman, Theodore I. ..... Minneapolis
Goldner, Meyer Z. ..... Minneapolis
Goldschmidt, Volker ..... Duluth
Goldsmith, Joseph W. ..... St. Paul
Goldstein, Norman P. ..... Rochester
† Goltz,, Edward V. ..... St. Paul
Goltz, Robert W. ..... Minneapolis
Good, C. Allen, Jr. ..... Rochester
Good, Hoff D. ..... Minneapolis
Good, Gary ..... Minneapolis
Good, Roy H. ..... Northfield
Goodchild, William R. ..... Minneapolis
Goodman, Charles E. ..... Virginia
Goodnow, William H. ..... Duluth
Gordon, John R. ..... Minneapolis
Gordon, Philip E. ..... Minneapolis
Gordon, Sewell S. ..... St. Louis Park
Gottlieb, Cornelius M. ..... Tacoma, Wash.
Gould, Allan B., Jr. ..... Rochester
Gowan, Lawrence R. ..... Duluth
† Graham, Archibald W. ..... Chisholm
Graham, Asa B. ..... Faribault
Grahek, Jack P. ..... Ely
† Granberry, W. Malcolm ..... Rochester
† Granquist, Richard D. ..... Minneapolis
Grant, Hendrie W. ..... St. Paul
Grant, John Carton ..... Sauk Centre
Grant, Suzanne ..... Minneapolis
† Gratzek, Frank R. ..... Minneapolis
† Gratzek, Thomas ..... St. Paul
Grau, Robert K. ..... St. Paul
Graudins, Gunars ..... Rochester
Graves, Richard B. ..... Red Wing
Gray, Edward F. ..... White Bear Lake
† Gray, Frank D. ..... Marshall
Gray, Royal C. ..... Minneapolis
Green, Clayton R. ..... Excelsior
Green, Paul A. ..... Rochester
Green, Robert A. ..... St. Louis Park
Greenberg, Albert J. ..... Minneapolis
Greene, Daniel E. ..... Thief River Falls
Greene, Laurence F. ..... Rochester
Greenfield, Irving ..... Minneapolis
Greenfield, William T. ..... Cokato
Greenspan, Richard H. ..... Minneapolis
¶ Greishiemer, Esther M ..... Philadelphia, Pa.
Gridley, John W. ..... Arlington
Griebie, Grant L. ..... Brownton
Griffin, John W., Jr. ..... Bemidji
Griffin, Richard P. ..... Benson
Grimes, Burton P. ..... St. Peter
Grimes, Marian ..... Minneapolis
Grimes, Paul T. ..... Park Rapids
Grimmell, Francis J. ..... Minneapolis
Grindlay, John H. ..... Rochester
Grinley, Andrew V. ..... Grand Rapids
*†Grise, William B. ..... Austin
Grismer, Jerome T. ..... Minneapolis
Grohs, William H. ..... Duluth
Gronvall, Paul R. ..... Minneapolis
Groschupf, Richard P. ..... Bemidji
Groschupf, Theodore P. ..... Bemidji
Grose, Frederick N. ..... Clarissa
Gross, John B. ..... Rochester
Grotting, John K. ..... Minneapolis
Gruys, Robert I. ..... Minneapolis
Guenther, Dean E. ..... St. Paul
Guilfoile, Pierre J. ..... Delano
Guldseth, Gustav J. ..... Hendricks
† Gullickson, Andrew ..... Minneapolis
Gullickson, Glenn, Jr. ..... Minneapolis
Gully, Raymond J. ..... Fort Mead, So. Dak.
Gunlaugson, Frederick G. ..... Minneapolis
Gustafson, Paul O. ..... Minneapolis
Gustafson, Robert W. ..... Fairfax
Gustason, Harold T. ..... Minneapolis
Guy, Jack A. ..... New London
Gyde, Maurice C. ..... St. Boniface, Manitoba

Haas, Jack F. ..... Northfield
Haase, Donald D. ..... Silver Bay
Haavik, John E. ..... Duluth
Habein, Harold C., Sr. ..... Wabasha
Haberer, Helen R. ..... Minneapolis
Haberland, Lyle F. ..... Minneapolis
Haberle, Charles A. ..... Duluth
† Haberman, Emil ..... Osakis
Haes, Julius E. ..... St. Peter
Hagan, Paul S. ..... St. Paul
Hagedorn, Albert B. ..... Rochester
Hagen, John D. ..... Austin
Hagen, Kristofer ..... Minneapolis
† Hagen, Olaf J. ..... Moorhead
Hagen, Wayne S. ..... Minneapolis
† Haggard, George D. ..... Minneapolis
† Haines, Samuel F. ..... Rochester
Hakanson, Erick Y. ..... St. Paul
Halbert, John J. ..... Duluth
Halenbeck, Philip L. ..... St. Cloud
Hall, Barnard ..... St. Paul
Hall, Harry B. ..... Minneapolis
Hall, Wendell H. ..... Minneapolis
Hall, William E. ..... Maple Lake
Hallberg, Olav E. ..... Rochester
† Hallenbeck, Dorr F. ..... Rochester
Hallenbeck, George A. ..... Rochester
Halliday, Phillip V. ..... Duluth
Hallin, Roger P. ..... Worthington
Halloran, Walter H. ..... Jackson
Halme, William B. ..... Wadena
Halper, Bernard ..... Hibbing
Halpern, David J. ..... Brewster
Halpin, Joseph E. ..... Rush City
Halverson, Donald E. ..... Winnebago
Halverson, Kermit J. ..... Chisholm
Halverson, William G. ..... Madelia
Halvorsen, Daniel K. ..... Owatonna
Halvorson, Harold C. ..... Luverne
Halvorson, James W. ..... Zumbrota
Hambidge, Gove, Jr. ..... Minneapolis
Hamel, Joseph I. ..... Minneapolis
Hamilton, Samuel L. ..... Red Wing
‡ Hamilton, Warren W., Jr. ..... St. Albans, N. Y.
Hamlon, John S. ..... Fergus Falls
Hammar, Lawrence M. ..... Mankato Clinic
Hammerstrom, Robert N. ..... Minneapolis
Hammes, Ernest M. ..... St. Paul
Hammes, Ernest M., Jr. ..... St. Paul
† Handler, Seymour ..... Minneapolis
† Haney, Claude L. ..... Duluth
Hankerson, Robert G. ..... Minnesota Lake
Hanlon, David G. ..... Rochester
Hannah, Hewitt B. ..... Minneapolis
Hannon, Donald W. ..... St. Paul

Hanover, Ralph D. ..... International Falls
Hansen, Cyrus O. ..... Minneapolis
Hansen, Erling W. ..... Minneapolis
Hansen, Milo L. ..... Little Falls
Hansen, Olga S. ..... Minneapolis
Hansen, Robert E. ..... Hibbing
Hansen, Rollin M. ..... Minneapolis
Hansen, Theodore M. ..... Albert Lea
Hanske, Edward A. ..... Minneapolis
*†Hanson, Adolph M. ..... Faribault
Hanson, Ernest O. ..... Cloquet
Hanson, Everett C. ..... New York Mills
Hanson, Harlow J. ..... Minneapolis
Hanson, Harold B. ..... Minneapolis
Hanson, Harold W. ..... Minneapolis
† Hanson, Henry V. ..... St. Paul
Hanson, John W. ..... Northfield
† Hanson, LeRoy W. ..... Bellaire, Texas
Hanson, Lewis ..... Frost
Hanson, Malcolm B. ..... Minneapolis
Hanson, Mark C. L. ..... Minneapolis
Hanson, Norbert O. ..... Rochester
Hanson, William A. H. ..... Minneapolis
Hanson, William B. ..... Minneapolis
Happe, Lawrence J. ..... Minneapolis
Harada, Thomas T. ..... Lake Wilson
† Harbaugh, John T. ..... Minneapolis
Hargraves, Malcolm M. ..... Rochester
Harmon, Gaius E. ..... St. Paul
† Harrington, Stuart W. ..... Rochester
Harrington, Vernon A., Jr. ..... Duluth
Harris, Leon D. ..... Minneapolis
Harris, Lloyd E. ..... Rochester
Harrison, Edgar G., Jr. ..... Rochester
Harrison, Percy W. ..... Worthington
Harrison, William C. ..... Minneapolis
Hart, William E. ..... Monticello
Harthel, William F. ..... St. Paul
Hartig, Marjorie ..... St. Paul
Hartjen, Jason K. ..... Bemidji
Hartman, Evelyn E. ..... Minneapolis
† Hartman, Howard R. ..... Rochester
Hartnagel, Grant F. ..... Red Wing
Hartridge, Virginia B. ..... Rochester
Hartung, Elmer H. ..... Claremont
Hartwich, Roger F. ..... Winona
Hartwig, John A. ..... Minneapolis
Hass, Frederick M. ..... Minneapolis
† Hassett, Roger G. ..... Unknown
Hastings, DeForest R. ..... Minneapolis
Hastings, Donald W. ..... Minneapolis
† Hatch, Walter E. ..... Duluth
Hauge, Erling T. ..... Minneapolis
Hauge, Malvin I. ..... Clarkfield
Haugen, George W. ..... Minneapolis
Haugen, John A. ..... Minneapolis
Hauser, Donald C. ..... Minneapolis
Hauser, George W. ..... Minneapolis
Hauser, Harris M. ..... Rochester
Hauser, Victor P. ..... St. Paul
Havel, Robert J. ..... Minneapolis
Haven, Walter K. ..... Minneapolis
† Havens, Fred Z. ..... Riverside, Calif.
† Havens, John G. W. ..... Austin
Hawk, Dale J. ..... St. Charles
Hawkinson, Raymond P. ..... Minneapolis
Hawley, George M. B., II ..... Red Wing
Hay, Lyle J. ..... Minneapolis
Hayes, Albert F. ..... St. Paul
† Hayes, James M. ..... Arcadia, Calif.
Hayles, Alvin B. ..... Rochester
Hays, Albert T. ..... Minneapolis
Head, Douglas P. ..... Minneapolis
† Healy, Raymond T. ..... Pierz
Hebbel, Robert ..... Minneapolis
† Hebeisen, Milton B. ..... Carver
Heck, Frank J. ..... Rochester
Heck, William W. ..... St. Paul
Hedemark, Homer H. ..... Ortonville
Hedemark, Truman A. ..... Ortonville
Hedenstrom, Frank G. ..... St. Paul
Hedenstrom, Philip C. ..... Marshall
Hedlund, Charles J. ..... St. Paul
Hedrick, William L. ..... Minneapolis
Heegaard, William G. ..... Alexandria
† Hegge, Olav H. ..... Austin
Heiam, William C. ..... Cook
† Heiberg, Emmett A. ..... Fergus Falls
Heiberg, Olaf M. ..... Worthington
Heid, James K. ..... Little Falls
Heilig, William R. ..... St. Paul
Heilman, Fordyce R. ..... Rochester
Heimark, John J. ..... Mankato
Heimark, Julius J. ..... Fairmont
Heinz, Ivy B. ..... Shakopee
Heinzerling, Carl R. ..... Chaska
Heise, Carl vR. ..... Winona
Heise, Paul vR. ..... Winona
Heise, Philip vR. ..... Winona
† Helland, John W. ..... Spring Grove
Heller, Edgar E. ..... Mankato
*†Helmholz, Henry F. ..... Rochester
Helseth, Hovald K. ..... Fergus Falls
Helwig, Karl L., Jr. ..... Kerkhoven
*†Hempstead, Bert E. ..... Rochester

Henderson, Arthur J. G. ..... No. St. Paul
Henderson, Edward D. ..... Rochester
Henderson, John W. ..... Rochester
Henderson, Lowell L. ..... Rochester
Hendricks, Esten J. ..... Verndale
† Hendrickson, John F. ..... Minneapolis
Hengstler, William H. ..... St. Paul
Henrikson, Earl C. ..... Minneapolis
Henry, Clarence J. ..... Milaca
† Henry, Clifford E. ..... Kirksville, Missouri
Henry, Harold W. ..... Hinckley
Henry, Joseph E. ..... Milaca
Henry, Kenneth G. ..... Owatonna
* Henry, Martin R. ..... St. Peter
*†Hensel, Charles N. ..... St. Paul
Hepper, Norman G. ..... Rochester
* Herbst, Richard P. ..... Willmar
Herbert, Willis L. ..... Minneapolis
Herman, Samuel M. ..... St. Paul
Hermann, Harold W. ..... Minneapolis
Hermanson, Peter E. ..... Hendricks
Herrmann, Edgar T. ..... St. Paul
† Hertel, Garfield E. ..... Austin
Hertz, Myron J. ..... St. Paul
Hesla, Inman A. ..... Austin
† Hewitt, Edith S. ..... Rochester
† Hewitt, Richard M. ..... Rochester
Higgins, John A. ..... Rochester
Higgins, John H. ..... Minneapolis
Hildebrand, John E. ..... Bemidji
Hilding, Anderson C. ..... Duluth
Hilger, Jerome A. ..... St. Paul
Hilger, Laurence D. ..... St. Paul
Hilgermann, George O. ..... Minneapolis
Hilker, Marcus D. ..... St. Paul
Hill, Earl ..... Minneapolis
Hill, Elmer M. ..... Minneapolis
† Hill, Frederick E. ..... Riverside, Calif.
† Hill, John P. ..... Lima, Ohio
Hill, John R. ..... Rochester
Hill, Richard W. ..... Rochester
† Hillis, Samuel J. ..... East Bradenton, Fla.
Hinckley, Robert G. ..... Minneapolis
Hinderaker, Harris P. ..... Bird Island
Hines, Edgar A., Jr. ..... Rochester
Hiniker, Louis P. ..... St. Paul
Hiniker, Peter J. ..... Le Sueur
Hinz, Walter E. ..... Willmar
† Hirschboeck, Frank J. ..... Duluth
Hirsh, Stanton A. ..... Crookston
= Hirshfield, Frank R. ..... Minneapolis
Hitchcock, Claude R. ..... Minneapolis
Ho, Shu Kang ..... St. Paul
Hochfilzer, John J. ..... St. Paul
† Hodapp, Robert V. ..... Minneapolis
Hodges, Kenneth V. ..... Minneapolis
Hodgson, Corrin H. ..... Rochester
Hodgson, Jane E. ..... St. Paul
Hodgson, John R. ..... Rochester
Hoeg, Dwight C. ..... Duluth
Hoeper, Philip G. ..... Mankato
Hoff, Herbert O. ..... Duluth
Hoffbauer, Frederick W. ..... Minneapolis
Hoffert, Henry E. ..... Minneapolis
Hoffman, Roy A. ..... Minneapolis
Hoffman, Walter L. ..... Minneapolis
Hoganson, Donald E. ..... Bemidji
† Hoidale, Andrew D. ..... Tracy
† Holcomb, Joel T. ..... Marine-on-St. Croix
† Holcomb, O. William ..... St. Paul
Holian, Darwin K. ..... Albert Lea
Holland, C. R. ..... Rochester
Hollenhorst, Robert W. ..... Rochester
Hollinshead, W. H. ..... St. Paul
Holm, Donald F. ..... Benson
Holman, Colin B. ..... Rochester
Holmberg, Conrad J. ..... Minneapolis
† Holmberg, LeRoy J. ..... Canby
Holmen, Robert W. ..... St. Paul
Holmes, Alva E. ..... Rush City
Holmstrom, Carle H. ..... Warren
† Holsinger, Donald R. ..... Rochester
Holt, John E. ..... St. Paul
Holten, John ..... Moorhead
Holzappel, Fred C. ..... Minneapolis
Hom, Leong Y. W. ..... Battle Lake, Minn.
Honath, Donald H. ..... Owatonna
Hooker, John P. ..... Rochester
† Hoover, Norman W. ..... Rochester
† Hopkins, Donald M. ..... Rochester
Hopkins, George W. ..... St. Paul
Hoppes, Emerson E. ..... Minneapolis
Horns, Howard L. ..... Minneapolis
Horns, Richard C. ..... Minneapolis
† Horton, Bayard T. ..... Rochester
Hoseth, Wayne L. ..... Minneapolis
Hottinger, Raymond C. ..... Janesville
Houglum, Arvid J. ..... Lake Park
Houkom, Bjarne ..... Minneapolis
Houkom, Samuel S. ..... Duluth
Houle, Rollin J. ..... New Brighton
Houts, Joseph C. ..... Dassel
Hovde, Rolf ..... Winthrop
Hovland, Melvin L. ..... Minneapolis
Howard, Eric G. ..... Spring Valley

Howard, Marshall J. ..... Mankato
Howard, Merrill A. ..... St. Paul
Howard, Robert B. ..... Minneapolis
Howard, Solomon E. ..... Minneapolis
Howe, Newell W. ..... South St. Paul
Howell, Carter W. ..... Minneapolis
Howell, Llewelyn P. ..... Rochester
Howell, Milton M. ..... Glencoe
Hoyer, Ludolf J. ..... Windom
† Hoyt, Charles S. ..... Rochester
Hruza, William J. ..... Madelia
Huber, Robert W. ..... St. Croix Falls, Wisconsin
Hubin, Edwin G. ..... Sandstone
Hudec, Elwyn R. ..... Echo
Hudson, George E. ..... Minneapolis
Huebert, Dan W. ..... Hutchinson
† Huenekens, Edgar J. ..... Minneapolis
Huff, J. S. ..... Owatonna
‡ Huff, James F. ..... Alexandria, La.
† Huffington, Herbert L. ..... Lutsen
Huffington, Herb L., Jr. ..... Waterville
Hughes, Bernard J. ..... Brainerd
Hughes, Sidney O. ..... Winona
Huizenga, Kenneth A. ..... Rochester
Hullsiek, Harold E. ..... St. Paul
Hulteng, Donald B. ..... Minneapolis
Hultkrans, Rudolph E. ..... Minneapolis
Humphrey, Edward W. ..... Moorhead
*†Humphrey, Wade R. ..... Stillwater
Hunt, Arthur B. ..... Rochester
Hunt, James Calvin ..... Rochester
† Hunt, James Cleon ..... Rochester
† Hunt, Roscoe C. ..... Fairmont
Hunt, William ..... Fergus Falls
Hunter, James S. ..... Rochester
Hunter, Murray H. ..... Farmington
Hunter, Samuel W. ..... St. Paul
*†Hurd, Annah ..... Minneapolis
Hurwitz, Milton M. ..... St. Paul
Husebye, Kjeld O. ..... St. Paul
† Hustad, Edward G. ..... Minneapolis
Hutchinson, Dorothy W. ..... Oak Terrace
Hutchinson, Henry ..... Moose Lake
† Huxley, Frederick R. ..... Faribault
Hymes, Charles ..... Minneapolis
† Hynes, John E. ..... Minneapolis

† Ide, Arthur W. ..... Creston, Iowa
Ide, Arthur W., Jr. ..... Minneapolis
Idstrom, Linneus G. ..... Minneapolis
Ikeda, Kano ..... St. Paul
Indeck, Walter ..... Minneapolis
Ingalls, Edgar G., Jr. ..... Minneapolis
Inglis, William ..... Redwood Falls
‡ Inlow, Robert P. ..... Columbia, S. C.
Ireland, Gerald W. ..... Grand Rapids
† Irvine, Harry G. ..... Minneapolis
Iverson, Rolf M. ..... Minneapolis
Ivins, John C. ..... Rochester
Ivy, Horace K. ..... Rochester

Jackman, Raymond J. ..... Rochester
Jackson, J. Albert ..... Minneapolis
Jackson, William C. ..... St. Paul
Jacobs, Douglas L. ..... Willmar
† Jacobs, Johannes C. ..... Willmar
Jacobson, Clarence ..... Chisholm
Jacobson, Clifford W. ..... Breckenridge
Jacobson, Ferdinand C. ..... Duluth
Jacobson, Loren J. ..... Rochester
Jacobson, Wyman E. ..... St. Louis Park
Jahnke, William R. ..... St. Paul
James, Ellery M. ..... St. Paul
James, John W. ..... Mahtomedi
Janda, George W., Jr. ..... Minneapolis
Janecky, Allen G. ..... Baudette
Janes, Joseph M. ..... Rochester
Janssen, Martin E. ..... St. Paul
† Jarvis, Bruce W. ..... St. Paul
Jarvis, Charles W. ..... St. Paul
Jarvis, Marilyn A. ..... St. Paul
Jastram, Rupert M. ..... St. Paul
Jay, Alan R. ..... Minneapolis
Jefferies, William L. ..... Minneapolis
Jedrzejewski, Walter Jay ..... Minneapolis
Jensen, Alvin M. ..... Brownton
Jensen, Harry C. ..... Minneapolis
Jensen, John A. ..... Crookston
† Jensen, Marius J. ..... Minneapolis
Jensen, Nathan K. ..... Minneapolis
Jensen, Reynold A. ..... Minneapolis
† Jensen, Thorvold J. ..... Duluth
Jenson, James E. ..... Stillwater
Jepson, William W. ..... Minneapolis
Jerome, Bourne ..... Minneapolis
Jerome, Elizabeth B. K. ..... Minneapolis
Jeronimus, Henry J. ..... Duluth
*†Jesion, J. W. ..... Pine River

Jessico, Charles M. ..... Duluth
Jeub, Robert P. ..... Minneapolis
Joffe, Harold H. ..... Virginia
Johanson, Waldemar G. ..... St. Paul
John, Robert H. ..... Duluth
Johnsen, Henry A., Jr. ..... Minneapolis
Johnson, Adelaide M. ..... Rochester
Johnson, Aldridge F. ..... Isle
Johnson, Angelo G. ..... Minneapolis
Johnson, Arthur B. ..... Minneapolis
Johnson, Calvin J. ..... Grand Rapids
Johnson, Carl E. ..... St. Paul
Johnson, Carl E. ..... Rochester
Johnson, Carolyn A. ..... St. Paul
Johnson, C. Percy ..... Tyler
Johnson, Curtis M. ..... Winona
Johnson, David R. ..... Minneapolis
Johnson, Douglas L. ..... Little Falls
Johnson, Edward A. ..... Minneapolis
† Johnson, Einer W. ..... Bemidji
Johnson, Einer W., Jr. ..... Rochester
Johnson, Frank E. ..... Minneapolis
Johnson, Harry A. ..... Minneapolis
Johnson, Herbert W. ..... St. Paul
† Johnson, James A. ..... Minneapolis
Johnson, John W. ..... Minneapolis
Johnson, Karl E. ..... Duluth
Johnson, Malcolm R. ..... Minneapolis
Johnson, Marvin W. ..... Dassel
Johnson, Morris B. ..... St. Paul
Johnson, Norman ..... Minneapolis
Johnson, Norman Paul ..... Minneapolis
Johnson, Norton T. ..... Minneapolis
Johnson, O. Guy ..... Bayport
Johnson, Olga H. ..... Moorhead
Johnson, Orville H. ..... Edina
Johnson, Paul E ..... Minneapolis
Johnson, R. J. ..... St. Paul
† Johnson, Ralph A. ..... Rochester
Johnson, Ralph B. ..... Lanesboro
Johnson, Ray A. ..... Breckenridge
Johnson, Reinald G. ..... Minneapolis
Johnson, Reuben A. ..... Minneapolis
Johnson, Richard S. ..... Minneapolis
Johnson, Robert E. ..... Minneapolis
Johnson, Robert H. ..... Bayport
Johnson, Roger S. ..... Wayzata
Johnson, Ronald G. ..... Minneapolis
Johnson, Victor ..... Rochester
Johnson, Vilhelm M. ..... Dawson
Johnson, William E. ..... Morgan
Johnson, Youbert T. ..... Minneapolis
Johnsrud, Luverne W. ..... Hibbing
Johnston, Henry W. ..... Virginia
Johnston, Leonard F. ..... Winona
Jolin, Francis M. ..... Grand Rapids
Jones, David G. ..... Minneapolis
† Jones, E. Mendelssohn ..... St. Paul
† Jones, Herbert W., Jr. ..... Minneapolis
Jones, Orville H. ..... Mankato
Jones, Richard H. ..... Minneapolis
† Jones, Richard N. ..... St. Cloud
Jones, William R. ..... Minneapolis
Jordan, Donald V. ..... Minneapolis
† Jordan, Kathleen B. ..... Granite Falls
Jordan, Lewis S. ..... Granite Falls
Jorgenson, Edward O. ..... Duluth
Joseph, Arnold H. ..... St. Paul
Josewich, Alexander ..... Minneapolis
Josewski, Raymond J. ..... Stillwater
Joyce, George L. ..... Rochester
Judd, Allen S. ..... Minneapolis
Judd, Edward S. ..... Rochester
Judd, Walter H. ..... Washington, D. C.
Juergens, Herman M. ..... Belle Plaine
Juergens, John L. ..... Rochester
Juergens, Manley F. ..... Stillwater
Juers, Edward H. ..... Red Wing
† Juliar, Richard O. ..... Los Angeles
Juntunen, Roy R. ..... Duluth
Jurdy, Mitchell J. ..... Minneapolis
Just, Herman J. ..... Hastings

† Kaasa, Lawrence J. ..... Albert Lea
† Kabrick, Ola A. ..... St. Peter
Kadesky, Harold B. ..... Minneapolis
Kaiser, Milton L. ..... New Ulm
Kalin, Oscar T. ..... Minneapolis
Kallestad, Leonard L. ..... Wayzata
Kamman, Gordon R. ..... St. Paul
Kanne, Earl R. ..... Brainerd
Kantar, Bruce L. ..... Minneapolis
Kaplan, David H. ..... St. Paul
Kaplan, Harold A. ..... Minneapolis
Kaplan, John J. ..... Minneapolis
Kapaner, Alfred T. ..... Princeton
Karges, Launel E. ..... Grand Rapids
Karish, Louis J. ..... Coleraine
Karleen, Bernard N. ..... Jackson
Karleen, Conrad I. ..... Minneapolis
Karlen, Markle ..... Minneapolis
Karn, Jacob F. ..... Ortonville
Karon, Irvine M. ..... St. Paul
Kasper, Eugene M. ..... St. Paul
Kasper, Robert E. ..... Minneapolis
Kath, Reinhard H. ..... Arlington
Katz, Louis J. ..... Long Beach, Calif.
Kaufman, Edward J. ..... Appleton
Kaufman, Herschel J. ..... Minneapolis
Kaufman, Walter B. ..... Mankato
Kaufman, William C. ..... Appleton
Kaye, Ronald L. ..... Rochester
Kazdan, Martin S. ..... Rochester
Kearney, Rochfort W. ..... Mankato
Kearns, Thomas P. ..... Rochester
Keating, Francis R., Jr. ..... Rochester
Keefe, Rolland E. ..... St. Paul
Keil, Marcus A. ..... Albert Lea
Keith, Haddow Mc. ..... Rochester
† Keith, Norman M. ..... Rochester
Keith, Paul J. ..... Milaca
Keithahn, Elmer E ..... Sleepy Eye
Kelby, Gjert M. ..... Minneapolis
Kelley, Maurice L., Jr. ..... Rochester
Kelley, Roger E. ..... Crosby
† Kelley, Walter M. ..... Madison, Wisc.
Kelly, Albert C. ..... St. Paul
Kelly, Charles F. ..... Minneapolis
Kelly, Edward H. ..... St. Paul
Kelly, James H. ..... St. Cloud
Kelly, John F. ..... Cold Spring
Kelly, John P. ..... Minneapolis
Kelly, John T. ..... Minneapolis
Kelly, Patrick J. ..... Rochester
Kelly, Robert T. ..... Grand Rapids
† Kelsey, Carleton G. ..... St. Paul
Kelsey, Chauncey M. ..... St. Paul
Kemp, Alphonse F. ..... Mankato
Kenefick, Emmett V. ..... St. Paul
Kennedy, Byrl J. ..... Minneapolis
† Kennedy, Claude C. ..... Minneapolis
Kennedy, George L. ..... Faribault
† Kennedy, Jane F. ..... Minneapolis
Kennedy, Roger L. ..... Rochester
Kenyon, Thomas J. ..... St. Paul
Kerkhof, Arthur C. ..... Minneapolis
Kernohan, James W. ..... Rochester
† Kesting, Herman ..... St. Paul
Kevern, Jay L. ..... Henning
Keyes, John D. ..... Winona
Keyes, Robert W. ..... Pipestone
Kiely, Joseph M. ..... Rochester
Kierland, Robert R. ..... Rochester
Kiesler, Frank, Jr. ..... Minneapolis
Kim, Mark K. ..... Minneapolis
† Kim, Robert ..... Rochester
Kimmel, George C., Jr. ..... Minneapolis
Kincaid, Owings W. ..... Rochester
King, Frances Willard ..... Oak Terrace
† King, George L. ..... Hudson, Wisconsin
King, Harold E. ..... Rochester
Kinkade, Byron R. ..... Ada
Kinsella, Thomas J. ..... Minneapolis
† Kinzel, Raymond C. ..... Rochester
Kiolbasa, Edward B. ..... Stillwater
Kippen, Neil ..... Breckenridge
Kirby, Thomas J., Jr. ..... Rochester
Kirklin, John W. ..... Rochester
‡ Kirshen, Robert ..... Chicago, Illinois
Kitzberger, Peter J. ..... New Ulm
Kjenaas, Ervin A. ..... Hastings
Klass, Donald W. ..... St. Paul
Klefstad, Lloyd H. ..... Greenbush
† Klein, Harry ..... Duluth
Klein, William A. ..... Duluth
Kline, Richard F. ..... St. Cloud
Knapp, Frank N. ..... Duluth
Knapp, Miland E. ..... Minneapolis
† Knight, Ralph T. ..... Minneapolis
† Knight, Ray R. ..... Minneapolis
Knoche, Harvey A. ..... Morgan
Knoedler, John P. ..... Duluth
Knoll, W. V. ..... Brainerd
Knudsen, Helen L. ..... Minneapolis
Knutson, Gerhard E. ..... St. Paul
Knutson, Kenneth R. ..... Hibbing
Knutson, Lewis A. ..... Spring Grove
Knutson, Robert C. ..... St. Paul
Kodres, Nina ..... St. Paul
Koelsche, Giles A. ..... Rochester
Koenecke, F. H. ..... Lakefield
† Koenig, Robert P. ..... Minneapolis
† Koenigsberger, Charles ..... Mankato
Koepcke, Gerald M. ..... Minneapolis
Kogl, Richard C. ..... Edina
Kohlbry, Carl O. ..... Duluth
† Kohler, Delphin W. ..... Tacoma, Wash.
Kohlhase, Robert E. ..... Minneapolis
† Kohn, Eleanor M. ..... Rochester
Kolars, James J. ..... Faribault
† Koller, Hermann M. ..... Minneapolis
Koller, Louis R. ..... Minneapolis
Koller, Robert L. ..... Hopkins
Kolp, Berton A. ..... Glenwood
Kooda, Jennings C. ..... Morris
Koons, W. R. ..... Mahnomen
‡ Koop, Severin H., Jr. ..... Sauk Rapids
Korchik, John P. ..... Minneapolis
Korda, Henry A. ..... Pelican Rapids
Kosiak, John Jr. ..... Minneapolis
Kosiak, William ..... Two Harbors
Kostick, William Robert ..... Fertile
Kotchevar, Frank R. ..... Eveleth
Kottke, Frederic J. ..... Minneapolis
Kotval, Russell J. ..... Pipestone
Koucky, Rudolph W. ..... Minneapolis
Kovack, Freeman D. ..... Minneapolis
Kozak, Michael J. ..... Minneapolis
Koza, Donald W. ..... St. Paul
Kozberg, Oscar ..... Moose Lake
Kraemer, George N. ..... Fairmont
Krafchuk, John D. ..... Minneapolis
Krafft, Walter E. ..... Minneapolis
Kragh, Lyle V. ..... Rochester
Krause, Carl W. ..... Fairmont
Kremen, Arnold J. ..... Minneapolis
Kreuzer, Titus C. ..... Marshall
Krezowski, Thomas K. ..... St. Paul
Krieser, Albert E. ..... Minneapolis
Krueger, Victor R. ..... Nopeming
Kruger, Elmer L., Jr. ..... Nashwauk
Krusen, Frank H. ..... Rochester
Kruzich, Stephen J. ..... Sleepy Eye
Krystosek, Lee A. ..... Janesville, Wis.
Kucera, Frank J. ..... Hopkins
Kucera, Stanley T. ..... Northfield
† Kucera, William J. ..... Santa Barbara Calif.
Kugler, Alex A. ..... St. Paul
Kuhlmann, Lawrence B. ..... Melrose
Kulstad, Oscar S. ..... Dodge Center
Kulzer, Norbert J. ..... Hastings
Kumm, Warren L. ..... Minneapolis
Kundel, Robert R. ..... Ely
Kuske, Albert W. ..... St. Paul
† Kusske, Arthur L. ..... New Ulm
Kusske, Bradley W. ..... St. Paul
Kusske, Douglas R. ..... St. Paul
Kusz, Clarence V. ..... Minneapolis
Kvale, Walter F. ..... Rochester
Kyle, Robert A. ..... Rochester

LaBree, John W. ..... St. Louis Park
LaBree, Robert H. ..... Duluth
LaFond, Edward M. ..... St. Cloud
Lagaard, Sheldon M. ..... Minneapolis
† Laird, Arthur T. ..... Duluth
† Lajoie, John M. ..... Minneapolis
Lake, Clifford F. ..... Rochester
Lamb, H. Douglas ..... Minneapolis
Lang, Leonard A. ..... Minneapolis
Lannin, Bernard G. ..... St. Paul
Lannin, Donald R. ..... St. Paul
‡ Lansche, Richard K. ..... New York, N. Y.
† Lapierre, Arthur P. ..... Minneapolis
Larrabee, Walter F., Jr. ..... St. Paul
Larsen, Frank Wm. ..... Minneapolis
Larson, Arnold ..... Detroit Lakes
Larson, Arthur K. ..... Minneapolis
Larson, Arthur N. ..... Fergus Falls
Larson, Clarence M. ..... Minneapolis
Larson, Donald M. ..... Minneapolis
Larson, Donald M. ..... Minneapolis
Larson, Dorette W. ..... Fergus Falls
Larson, Eva Jane O. ..... St. Paul
Larson, Gerald E. ..... Cambridge
Larson, James T. ..... South St. Paul
Larson, Keith ..... Moose Lake
Larson, Kenneth R. ..... St. Paul
Larson, Lawrence M. ..... Minneapolis
Larson, Leighton W. ..... Waconia
Larson, Leonard M. ..... Oak Terrace
Larson, Leroy James ..... Bagley
Larson, Loren J. ..... Minneanolis
Larson, Martin L. ..... St. Paul
Larson, Milo H. ..... Lake Benton
Larson, Norman E. ..... Rochester
Larson, Oliver E. H. ..... Zumbrota
Larson, Paul N. ..... Minneapolis
Larson, Robert L. ..... Rochester
Larson, Roger C. ..... Minneanolis
Larson, Wyllis G. ..... St. Paul
Laszewski, Franz von Zelberschwecht ..... St. Paul
Latterell, Kenneth E. ..... Duluth
Latts, Elliot M. ..... Minneapolis
† LaVake, Rae T. ..... Minneapolis
Law, Harrison E. ..... Virginia
Lawson, Warren R. ..... Minneapolis
Laymon, Carl W. ..... Minneapolis
Lazarte, Jorge A. ..... Rochester
† Leahy, Bartholomew ..... St. Paul
Leavenworth, Richard O., Jr. ..... St. Louis Park
Leck, Paul C. ..... Austin
Lee, Gordon E. ..... Glenwood
Lee, Hubert W. ..... Brainerd
Lee, Norman J. ..... Tracy
Lee, Robert E. ..... Rochester
Leek, Joseph H. ..... Duluth

Leemhuis, Andrew J. ..... Minneapolis
† Leibold, Herbert H. ..... Parkers Prairie
Leick, Richard M. ..... St. Paul
Leiferman, Robert J. ..... Minneapolis
† Leigh, John E. ..... Rochester
Leinonen, Wendla E. ..... Anoka
Leitch, Archibald ..... St. Paul
Leland, Harold R. ..... Minneapolis
Lenander, Mellvin E. L. ..... St. Peter
† Lenarz, Albert J. ..... Browerville
Lende, Norman ..... Faribault
Lenz, Joseph R. ..... Morton
Lenz, Otto A. ..... Minneapolis
Leonard, Lawrence J. ..... Minneapolis
Leonard, Samuel ..... Minneapolis
† Leopard, Brand A. ..... Brownsville, Texas
† Lepak, Francis J. ..... Duluth
Lepak, John A. ..... St. Paul
Leppo, N. Erkki A. ..... Duluth
† Lerche, William ..... Cable, Wis.
Lerner, A. Ross ..... Minneapolis
L'esperance, Bernard F. ..... Two Harbors, Minn.
Lester, Malcolm J., Jr. ..... Truman
Lester, Richard G. ..... Minneapolis
Letson, Robert D. ..... Glenwood
Leven, Nathaniel L. ..... St. Paul
Leverenz, Carleton W. ..... St. Paul
Levitt, Geo. X. ..... St. Paul
Lewis, Arthur J. ..... Henning
Lewis, Charles W. ..... Henning
Lewis, David R. ..... Rochester
Lewis, Joyce S., Jr. ..... St. Paul
Lick, Charles L. ..... St. Paul
Lick, Louis C. ..... St. Paul
Lick, William J., Jr. ..... St. Paul
† Lidsky, Martin D. ..... Rochester
† Liedloff, Adolph G. ..... Mankato
Lien, Richard J. ..... St. Paul
Lienke, Roger I. ..... Robbinsdale
Liffrig, William W. ..... Red Wing
† Lightbourn, Edgar L. ..... Hastings
Lilleberg, Norbert J. ..... St. Paul
Lillehei, C. Walton ..... Minneapolis
Lillehei, Elmer J. ..... Robbinsdale
Lillie, John C. ..... Rochester
Lima, Ludvig R. ..... Montevideo
Limbeck, Donald A. ..... Le Sueur
‡ Lind, Carl John, Jr. ..... Ft. McPherson, Ga.
Lindahl, Merlyn J. ..... Sherburn
Lindberg, Alfred L. ..... Wheaton
Lindberg, Arthur N. ..... Minneapolis
† Lindberg, Arvid C. ..... Minneapolis
Lindberg, Vernon L. ..... Minneapolis
Lindberg, W. R. ..... Minneapolis
Lindblom, Alton E. ..... North Mankato
Lindblom, Maurice L. ..... Minneapolis
*† Linde, Herman ..... Cyrus
Lindell, Robert ..... St. Paul
Lindeman, Raymond J. ..... Paynesville
Lindemann, Charles E. ..... Minneapolis
Linderholm, Bruce E. ..... Minneapolis
Lindgren, Russell C. ..... Minneapolis
Lindley, Stanley B. ..... St. Cloud
Lindquist, Richard H. ..... Minneapolis
Linke, Charles A. ..... Duluth
Linke, Clara L. ..... Duluth
Linner, Gunnar ..... Minneapolis
† Linner, Henry P. ..... Minneapolis
Linner, John H. ..... Minneapolis
Linner, Paul W. ..... Minneapolis
Lipman, Emanuel S. ..... Minneapolis
Lipman, Hyman S. ..... St. Paul
Lippmann, Elmer W. ..... Hutchinson
Lipschultz, Oscar ..... Minneapolis
Lipscomb, Paul R. ..... Rochester
† Lipson, Richard L. ..... Rochester
† Litchfield, John T. ..... Minneapolis
Litin, Edward M. ..... Rochester
Litkewitsch, Helene ..... St. Paul
Litman, Abraham B. ..... Minneapolis
Litman, Samuel N. ..... Duluth
Litzow, Thaddeus J. ..... Rochester
Lober, Paul Hallam ..... Minneapolis
Loes, Louis A. ..... St. Cloud
Lofgren, Karl A. ..... Rochester
Lofsness, Stanley V. ..... St. Paul
Logan, George B. ..... Rochester
† Logefeil, Rudolph C. ..... Minneapolis
Logothetis, John A. ..... Minneapolis
Lohmann, John G. ..... Pinestone
Loken, Selmur M. ..... St. Paul
Loken, Theodore ..... Ada
Lommen, Peter A., Jr. ..... Austin
Lommen, Peter A. ..... Austin
Longfellow, Helen W. ..... Brainerd
† Loomis, Earl A. ..... Hopkins
Loomis, George L. ..... Winona
† Lorenc, Ernest ..... Rochester
Lorentzen, Ernest S. ..... Detroit Lakes
Lott, Frederick H. ..... Minneapolis
Louisell, Charles T. ..... Fairmont
Love, Frederick A. ..... Carlos
Love, J. Grafton ..... Rochester
Lovett, Beatrice R. ..... Oak Terrace

Lowe, Alexander D. ..... So. St. Paul
Lowe, Earl R. ..... So. St. Paul
Lowe, Thomas A. ..... So. St. Paul
Lowry, Elizabeth C. ..... Minneapolis
Lowry, Paul T. ..... Minneapolis
Lowry, Thomas ..... Minneapolis
Lu, Cheng-En ..... Fergus Falls
† Luck, Hilda ..... Mankato
Lueck, Wallace W. ..... Minneapolis
Lufkin, Nathaniel H. ..... Minneapolis
* Luckmeyer, Carl J. ..... St. Cloud
Lukk, Olaf ..... Montgomery
Lund, Carl J. ..... Fergus Falls
Lund, Chester A. ..... Duluth
Lund, George W. ..... Minneapolis
Lund, J. Benjamin ..... Mankato
Lund, Werner J. ..... Staples
Lundberg, Ruth I. ..... Minneapolis
Lundblad, Roy A. ..... Minneapolis
Lundblad, Stanley W. ..... Minneapolis
Lundeberg, Karl R. ..... Minneapolis
Lundell, Carl L. ..... Granite Falls
Lundholm, Arthur M. ..... Harris
Lundquist, Curt W. ..... Owatonna
Lundquist, Virgil J. ..... Minneapolis
Lundsten, Leslie C. ..... Bemidji
Lundy, John S. ..... Rochester
Lynch, Francis W. ..... St. Paul
† Lynch, Matthew J. ..... Minneapolis
Lynde, Orrin G. ..... Los Gatos, Calif.
Lyon, John D., Jr. ..... Hopkins
Lyons, James H. ..... Minneapolis
Lyons, Michael W. ..... Minneapolis
Lyons, William S. ..... Douglas
† Lysne, Henry ..... Minneapolis
Lysne, Myron ..... Robbinsdale
Lyzenga, Anton G. ..... Minneapolis

McAllister, James ..... Rochester
McBean, James B. ..... Rochester
McCabe, James S. ..... St. Paul
McCaffrey, Fabian J. ..... Wayzata
McCain, Donovan L. ..... St. Paul
McCampbell, Malcolm D. ..... Minneapolis
McCannel, Malcolm A. ..... Minneapolis
McCarten, Francis M. ..... Stillwater
McCarthy, Austin M. ..... Willmar
McCarthy, Donald ..... St. Paul
McCarthy, Joseph J. ..... St. Paul
* McCartney, James S. ..... Minneapolis
McCaslin, Frank E., Jr. ..... Rochester
† McClanahan, James H. ..... White Bear Lake
McClanahan, Thomas S. ..... White Bear Lake
McClellan, Robert J. ..... St. Paul
McCloud, Charles N., Jr. ..... St. Paul
McConahey, William M., Jr. ..... Rochester
McCormick, Donald P. ..... Minneapolis
McCoy, Donald E. ..... Glencoe
† McCoy, Mary K. ..... Duluth
† McDaniel, Oriana ..... Minneapolis
McDaniel, Samuel P. ..... Lakeville
† McDonald, Archibald L. ..... Duluth
McDonald, Colin C. ..... Rochester
McDonald, Owen G. ..... Duluth
† McDowell, John P. ..... St. Cloud
McEnaney, Clifford T. ..... Owatonna
McEwan, Alexander ..... St. Paul
McFarland, Arthur H. ..... Minneapolis
McGandy, Robert F. ..... Minneapolis
McGeary, George E. ..... Minneapolis
McGill, Leon K. ..... Virginia
McGoon, Dwight C. ..... Rochester
McGroarty, Brian J. ..... St. Paul
* McGroarty, J. J. ..... Easton
McHaffie, Orval L. ..... Duluth
McHutchison, Samuel K. ..... St. Charles
McIlhany, Mary Lou ..... Lantana, Florida
McInerny, Maurice W. ..... Minneapolis
McIntyre, John A. ..... Owatonna
McKaig, Alan M. ..... Red Lake Falls
McKelvey, John L. ..... Minneapolis
McKenna, Elizabeth M. ..... San Francisco, Calif.
McKenna, John J. ..... Virginia
† McKenna, J. K. ..... Austin
McKenna, Maurice J. ..... Grand Rapids
McKenzie, Charles H. ..... Minneapolis
McKenzie, Eva E. ..... St. Paul
McKinlay, Chauncey A. ..... Minneapolis
McKinlay, Gordon L. ..... Minneapolis
McKinney, Frank S. ..... Minneapolis
McLane, William O. ..... Brainerd
McLaughlin, Byron H. ..... Minneapolis
† McLaughlin, Edmund M. ..... Winona
McMahan, Robert O. ..... Rochester
McManus, William P. ..... Princeton
McMurtrie, William B. ..... Minneapolis
McNear, George R., Jr. ..... Mankato
McNeil, John J. ..... Minneapolis
McNeil, Maurice R. ..... Glencoe
McNeill, John A. ..... St. Paul
McNutt, John R. ..... Duluth

McParland, Felix A., Jr. ..... Minneapolis
McPheeters, Herman O. ..... Minneapolis
† McQuarrie, Irvine ..... Minneapolis
MacCarty, Collin S. ..... Rochester
† MacCarty, William C. ..... Rochester
MacCornack, Robert L., Jr. ..... St. Paul
† MacDonald, Daniel A. ..... Minneapolis
MacDonald, John W. ..... Minneapolis
MacDonald, Roger A. ..... Littlefork
MacKinnon, Donald C. ..... Minneapolis
MacLean, Lloyd D. ..... St. Paul
MacRae, Gordon C. ..... Duluth
Mach, Frank B. ..... Minneapolis
Mach, Ralph F. ..... Pine City
Macheledt, Neil L. ..... Anoka
Macklin, William E., Jr. ..... Willmar
Mackoff, Samuel M. ..... Phoenix, Arizona
Madland, Robert S. ..... St. Paul
Maeder, Edward C. ..... Minneapolis
Magath, Thomas B. ..... Rochester
Magney, Fredolph H. ..... Duluth
Magnuson, Allen E. ..... Wheaton
Magnuson, Raymond C. ..... Cambridge
Magraw, Richard M. ..... Minneapolis
† Magee, Charles J. ..... Rochester
Maher, Frank T. ..... Rochester
Mahle, Donald G. ..... Plainview
Mahle, James P. ..... Minneapolis
Maitland, Edwin T. ..... Jackson
Maks, Stephen W. ..... Portland, Oregon
† Maland, Clarence O. ..... Minneapolis
Malerich, J. Anthony ..... So. St. Paul
Malerich, J. Anthony, Jr. ..... St. Paul
‡ Malkasian, George D., Jr. ..... North Chicago, Ill.
Malmstrom, John A. ..... Virginia
Mandel, Sheldon L. ..... Minneapolis
Mankey, James C. ..... Minneapolis
Mankin, Harold T. ..... Rochester
Manlove, Charles H., Jr. ..... St. Paul
Mann, George A. ..... Minneapolis
† Manson, Frank M. ..... Worthington
MarCia, Alfred M. ..... Minneapolis
‡ Margulis, Alexander R. ..... Fort Bragg, North Carolina
Mark, Arron L. ..... Minneapolis
Marking, George H. ..... Minneapolis
Marks, Roger W. ..... St. Paul
Marrone, Patrick H. ..... Duluth
Marshall, Clark M. ..... Crosby
Marsovszky, Paul J. ..... Moorhead
Martens, Theodore G. ..... Rochester
Martin, Albert C. ..... LuVerne
Martin, Dwight L. ..... St. Paul
Martin, Frank E. ..... Minneapolis
Martin, George B. ..... Thief River Falls
Martin, George R. ..... Minneapolis
Martin, Gordon M. ..... Rochester
Martin, John T. ..... Rochester
‡ Martin, Maurice J. ..... San Juan, Porto Rico
† Martin, Thomas P. ..... Minneapolis
Martin, Webster C. ..... Duluth
Martin, William B. ..... Duluth
Martin, William J. ..... Rochester
† Martineau, Joseph L. ..... St. Paul
Martinson, Carl J. ..... Wayzata
Martinson, Elmer J. ..... Wayzata
Marvin, Joseph E. ..... Brainerd
† Mason, Duncan M. ..... Rochester
† Mason, James C. ..... Rochester
Mason, James K. ..... Rochester
Mast, Fredric L. ..... Chisholm
Mastman, Gary J. ..... Rochester
Mateo, Guillermo ..... St. Paul
Mathieson, Don R. ..... Rochester
Matthews, James H. ..... Minneapolis
Mattison, Percy A. ..... Winona
Mattson, Albert D. ..... St. James
Mattson, Hamlin A. N. ..... Minneapolis
Maunder, John B. ..... Minneapolis
Maus, Philip W. ..... Dawson
† Maxeiner, Stanley R. ..... Minneapolis
Maxeiner, Stanley R., Jr. ..... Minneapolis
May, Robert B. ..... Fergus Falls
Mayberg, Donald M. ..... Minneapolis
Mayberry, William E. ..... Rochester
Mayne, John G. ..... Rochester
Mayne, Roy M. ..... Nopeming
Mayo, Charles W. ..... Rochester
† Maytum, W. James ..... Rochester
Mazzitello, William F. ..... St. Paul
† Mead, Charles H. ..... Duluth
Mears, Burtis J. ..... St. Paul
Medelman, John P. ..... St. Paul
Meinert, Albert E. ..... Winona
Meinert, John K. ..... Willmar
Mishek, Charles J. ..... St. Paul
Mithy, Irvin L. ..... Minneapolis
Mitchell, Berton D. ..... Minneapolis
Mitchell, Edward C. ..... Minneapolis
Mitchell, G. S. ..... Stillwater
Mitchell, Mancel T. ..... Minneapolis
Mixer, Harry W. ..... Minneapolis
Moberg, Clarence W. ..... Detroit Lakes

Mochal, Milo A. ..... Thief River Falls
Moe, John H. ..... Minneapolis
Moe, Thomas ..... Moose Lake
Moe, W. Wyatt ..... St. Paul
Moehn, John T. ..... Minneapolis
Moehring, Henry G. ..... Duluth
Moen, Johannes K., Jr. ..... Minneapolis
† Moersch, Fred P. ..... Fort Lauderdale, Fla.
Moersch, Herman J. ..... Rochester
Moertel, Charles G. ..... Rochester
Moga, John A. ..... St. Paul
Molander, Herbert A. ..... St. Paul
Molenaar, Robert E. ..... Cannon Falls
Moller, Jurgen ..... Farmington
Mollers, Theodore P. ..... Soudan
Molnar, George D. ..... Rochester
† Monahan, Elizabeth S. ..... Minneapolis
Monahan, Robert H. ..... St. Paul
Monserud, Nels O. ..... Cloquet
Monson, Einer M. ..... Minneapolis
Monson, Leonard J. ..... Canby
Montgomery, Hamilton ..... Rochester
Mooney, Robert D. ..... St. Paul
Moore, Irvin H. ..... Minneapolis
Moorhead, Marie ..... Minneapolis
Moos, Daniel J. ..... Minneapolis
† Moquin, Marie A. ..... St. Paul
Moran, Leo J. ..... Minneapolis
† Morehead, Dewey E. ..... Bodega Bay, Calif.
† Moren, J. Adelaide ..... White Bear Lake
Morgan, Hugh O. ..... Amboy
Moriarty, Berenice ..... St. Paul
Moriarty, Cecile R. ..... St. Paul
Morisaki, Michael M. ..... Rochester
Mork, Arthur H. ..... Anoka
Mork, Frank E. ..... Anoka
Morlock, Carl G. ..... Rochester
Morrell, Frank ..... Minneapolis
Morrison, Charlotte J. ..... Minneapolis
Morrow, George W., Jr. ..... Rochester
Morse, Morton P. ..... LeRoy
Morsman, L. W. ..... Hibbing
† Mortensen, Nels G. ..... Minneapolis
Mortenson, Howard O. ..... Menahga
Mosby, Maurice E. ..... Long Prairie
Moses, Royal R. ..... Kenyon
Moskowitz, Roland W. ..... Rochester
Mosser, Donn G. ..... Minneapolis
Moulton, Keith B. ..... St. James
Mouritsen, Glenn J. ..... Fergus Falls
Moyer, John B. ..... Duluth
Moyer, Leonard B. ..... Minneapolis
Mueller, Donald R. ..... Bagley, Minnesota
Mueller, Rudolph B. ..... Richmond
Muesing, William J. ..... New Ulm
* Muir, Walter F. ..... Browns Valley
Mulder, Donald W. ..... Rochester
Mulholland, William M. ..... Minneapolis
Muller, A. Eugene ..... North St. Paul
Muller, John J ..... Hibbing
Mulligan, Arthur M. ..... Brainerd
Mundahl, Harold R. ..... St. Paul
Munger, James E. ..... Duluth
Munson, Martin S. ..... Barnum
Murn, Thomas G. ..... St. Cloud
Murphy, Edmund P. ..... Minneapolis
† Murphy, Frank P. ..... Rochester
Murphy, Jack T. ..... St. Paul
Murphy, Joseph E. ..... Marshall
Murray, Elisabeth ..... Minneapolis
Murray, Robert A. ..... Hibbing
† Murray, Roger C. ..... Madison, Wis.
Murtaugh, Robert J. ..... Wadena
Musachio, Nicholas F. ..... Foley
Muske, Marvin M. ..... Minneapolis
Mussey, Mary E. ..... Rochester
Musty, Nicholas J. ..... Minneapolis
Myers, Jay A. ..... Minneapolis
Myers, John W. ..... Canby
Myers, Thomas T. ..... Rochester
Myhre, James ..... Minneapolis
Myre, Clifford R. ..... Paynesville

Nagel, Harold D. ..... Minneapolis
Nagobads, Visvaldis J. ..... Minneapolis
Nakamura, James Y. ..... Deer River
Nash, Eldore B. ..... Minneapolis
Nash, Leo A. ..... St. Paul
Naslund, Ames W. ..... Minneapolis
Nauth, Bernard S. ..... Minneapolis
Navratil, Donald R. ..... Glencoe
Neal, Joe M. ..... Minneapolis
Nealy, Donald E. ..... Adrian
Neary, Richard P. ..... Minneapolis
Neel, Harry B. ..... Albert Lea
Neff, Walter S. ..... Virginia
Nehring, Jesse P. ..... Preston
Neibergs, Lidija ..... St. Paul
Neibergs, Paul S. ..... St. Paul
Neils, Vernon E. ..... Sauk Rapids
Nellmark, Donald R. ..... Virginia
† Nelson, Bernette G. ..... Hoyt Lakes
† Nelson, Bernice A. ..... Minneapolis
Nelson, C. Barton ..... Minneapolis
Nelson, Carleton A. ..... Minneapolis
Nelson, Charles H. ..... Albert Lea
Nelson, Clayton E. ..... Albert Lea
Nelson, Edward N. ..... Minneapolis
Nelson, Erland R. ..... Minneapolis
Nelson, Ernest J. ..... Lonsdale
Nelson, Glenn E. ..... Fairfax
Nelson, Gunard A. ..... Minneapolis
Nelson, Harvey N. ..... Minneapolis
† Nelson, Henry E. ..... Crookston
† Nelson, Jerald C. ..... Rochester
Nelson, Lloyd S. ..... Minneapolis
Nelson, Loren E. ..... St. Paul
† Nelson, Louis A. ..... St. Paul
Nelson, Louis A., Jr. ..... St. Paul
Nelson, Luther A. ..... Rush City
Nelson, Maxine O. ..... Minneapolis
Nelson, Maynard C. ..... Minneapolis
Nelson, O. L. Norman ..... Minneapolis
Nelson, Robert H. ..... Benson
Nelson, Roy A. ..... Fergus Falls
Nelson, Wallace I. ..... Minneapolis
Nelson, Wilburn O. ..... Sanborn
† Nelson, Wilhma B. ..... Albert Lea
† Nerenberg, Sidney ..... Minneapolis
Nesheim, Martin O. ..... Emmons
Ness, Richard A. ..... Fergus Falls
Nessa, Curtis B. ..... St. Cloud
Nesse, James A. ..... Austin
Nesset, Lawren B. ..... Minneapolis
Nesset, William D. ..... Minneapolis
Neumaier, Arthur ..... Glencoe
Neumann, Conrad A. ..... Lewiston
Neumann, Roland R., Jr. ..... Minneapolis
Neumeister, Charles A. ..... Minneapolis
Newberry, Truman A. ..... St. Paul
Niazi, Suad A. ..... Granite Falls
Nichols, Donald R. ..... Rochester
Nichols, Raymond D. ..... Crosby
† Nicholson, Murdoch A. ..... Duluth
Nicholson, Richard W. ..... Heron Lake
Nickerson, John R. ..... Fairmont
Nickerson, Neil D. ..... Fairmont
Niehaus, Karl F. ..... Rochester
* Nielsen, Alvin M. ..... Northfield
Nietfeld, Aloys B. ..... Sauk Centre
Nimlos, Kenneth O. ..... St. Paul
† Nimlos, Lenore O. ..... St. Paul
Ninneman, Newton N. ..... Waconia
Nisius, George F. ..... Duluth
Nixon, James B. ..... Crosby
Noble, John F. ..... St. Paul
Noble, J. Lawrence ..... St. Paul
Nolan, Robert B. ..... Rochester
Nolan, Robert K. ..... Minneapolis
Nollet, Donald J. ..... Hibbing
Noran, Axel S. ..... Minneapolis
Noran, Harold H. ..... Minneapolis
Norberg, Carl E. ..... Cloquet
Nord, J. Erling ..... Staples
Nord, Robert E. ..... Minneapolis
† Nordin, Gustaf T. ..... Saratoga, Calif.
Nordland, Martin ..... Minneapolis
Nordland, Martin, Jr. ..... Minneapolis
Nordlund, Mildred E. ..... Cass Lake
Nordman, Willard F. ..... Mora
Norman, David D. ..... St. Paul
Norman, Mark L. ..... Minneapolis
Normann, Stephen T., Jr. ..... Waseca
Norquist, Joseph L. ..... St. Paul
Norris, Neil T. ..... Caledonia
Norstrom, Craig W. ..... Rochester
Norval, Mildred A. ..... St. Paul
† Novak, Edward E. ..... New Prague
Nuebel, Charles J. ..... St. Paul
† Nuessle, Walter G. ..... Springfield
Nuessle, William F. ..... Minneapolis
Nuetzman, Arthur W. ..... Faribault
Nutting, Roland E. ..... Duluth
Nydahl, Malvin J. ..... Minneapolis
† Nydell, Carl C., Jr. ..... Arlington, Calif.
Nye, Katherine A. ..... St. Paul
Nye, Lillian L. ..... St. Paul
Nygren, William T. ..... Braham
Nyhus, Ralph E. ..... Hibbing
Nylander, Emil G. ..... Minneapolis
Nywall, Dean D. ..... Slayton

O'Brien, John C. ..... St. Paul
O'Brien, Louis T. ..... Breckenridge
O'Brien, William A. ..... Minneapolis
† O'Connor, Daniel C. ..... Eden-Valley
† O'Donnell, James E. ..... Minneapolis
O'Hanlon, John A. ..... Minneapolis
O'Kane, Thomas W. ..... St. Paul
O'Keefe, James P. ..... St. Cloud
O'Leary, John B. ..... Brainerd
O'Malley, Valentine ..... St. Paul
O'Neill, John C. ..... Duluth
O'Phelan, E. Harvey ..... Minneapolis
O'Reilley, Bernard E. ..... St. Paul
Ochsner, Clarence G. ..... Wabasha
Ockuly, Orville E. ..... St. Paul
† Odel, Howard M. ..... Rochester
Odland, Donald M. ..... Luverne
Odland, Mark E. ..... Detroit Lakes
Odland, Olin M. ..... Granite Falls
Oeljen, Siegfried C. ..... Waseca
† Ogden, Warner ..... St. Paul
† Ohage, Justus ..... St. Paul
Okihiro, Michael M. ..... Rochester
Olavs, Olga ..... Minneapolis
Olds, George H. ..... New Richland
Olfelt, Paul C. ..... Minneapolis
Olinger, John Neil ..... St. Cloud
Olive, John T., Jr. ..... Mankato
Oliver, Irwin L. ..... Graceville
Oliver, James ..... Moorhead
Olmanson, Edmund G. ..... St. Peter
Olmanson, Myron D. ..... St. Peter
Olsen, Arthur M. ..... Rochester
Olsen, E. George ..... Minneapolis
Olsen, Jay R. ..... Minneapolis
Olsen, Ralph L. ..... St. Paul
Olson, Albert E. ..... Duluth
Olson, Albert J. ..... Owatonna
Olson, Alton C. ..... Minneapolis
Olson, Archie O. ..... Duluth
* Olson, C. A. ..... St. Paul
Olson, Carl J. ..... Minneapolis
Olson, C. Kent ..... Minneapolis
Olson, Chester J. ..... Belle Plaine
Olson, Detlof M. ..... Minneapolis
Olson, Duane O. ..... Gaylord
Olson, Ernest A. ..... Pine Island
Olson, Grant E. ..... West Concord
Olson, Gregory M. ..... Litchfield
Olson, Lillian A. ..... Ah-gwah-ching
† Olson, Olaf A. ..... Minneapolis
Olson, Philip A. ..... Minneapolis
Olson, Rolland A. ..... Wayzata
Olson, Robert T. ..... Canby
Onsgard, L. Kenneth ..... Houston
Oppegaard, Chester L. ..... Crookston
Oppen, E. Gerhard ..... Minneapolis
Oppen, Melvin G. ..... Wayzata
Opsahl, Lawrence J. ..... Willmar
Opstad, Earl T. ..... Minneapolis
Orr, Burton A. ..... Faribault
Osborn, Donald O. ..... Austin
Osmundson, Philip J. ..... Rochester
Ostergaard, Erling ..... Evansville
Ostergren, Edward W. ..... St. Paul
Ott, Eugene C. ..... Minneapolis
Otto, Henry C. ..... Frazee
Ouellette, Alfred J. ..... St. Paul
Ourada, Anthony L. ..... Fairmont
Overton, Dolphin H., Jr. ..... Rochester
Owen, Charles A., Jr. ..... Rochester
Owen, Richard R. ..... Minneapolis
Owens, Ben P. ..... Hibbing
Owens, Frederick M., Jr. ..... St. Paul
Owens, William A. ..... Montevideo
† Ownbey, Richard P. ..... Rochester
Ozolins, Marta ..... Faribault

Paal, Dwain J. ..... Minneapolis
Paciotti, Vincent J. ..... Hibbing
Page, Raymond L. ..... Minneapolis
Palen, Benjamin J. ..... Minneapolis
Palm, Neil M. ..... St. Paul
Palmer, Clinton F. ..... Albert Lea
Palmer, Gerald K ..... Minneapolis
Palmer, Harry A. ..... Blackduck
† Pankratz, Peter J. ..... Taiwan, Formosa
Papermaster, Ralph ..... Two Harbors
Papermaster, Theodore G. ..... Minneapolis
† Papp, Andrew ..... Rochester
Paris, Jaime ..... Rochester
Park, Wilford E. ..... Minneapolis
Parker, Charles W. ..... Wadena
* Parker, H. L. ..... Rochester
Parker, Robert L. ..... Rochester
Parker, Warren E. ..... Sebeka
Parker, Wilbert H. ..... Chisholm
Parkhill, Edith M. ..... Rochester
Parkin, Thomas W. ..... Rochester
Parr, Eugene Q. ..... Rochester
Parson, E. Irvine ..... Duluth
Parson, E. Lillian ..... Elbow Lake
Parson, Lester R. ..... Elbow Lake
Parsons, R. A. ..... St. James
Parsons, Ralph L. ..... Monterey
Pascuzzi, Chris A. ..... Rochester
Pasek, Antone W. ..... Cloquet
Patch, Orien B. ..... Duluth
Patrick, Robert T. ..... Rochester
Pattee, James J. ..... Minneapolis
Patterson, Hugh D. ..... Slayton
† Patterson, William L. ..... Fergus Falls
Paulson, Elmer C. ..... Minneapolis
Paulson, John A. ..... Rochester

† Paulson, Theodore S. ..... Fergus Falls
Paulson, Wallace J. ..... Minneapolis
Paulus, Harold E. ..... Austin
Payne, Richard E. ..... Virginia
Payne, William S. ..... Rochester
† Pearsall, R. P. ..... Virginia
Pearson, Bror F. ..... Shakopee
Pearson, Fritz R. ..... St. Paul
Pearson, Malcolm M. ..... St. Paul
Pease, Gertrude L. ..... Rochester
Peck, Willard R. ..... St. Paul
Pedersen, Arthur H. ..... St. Paul
Pedersen, Robert L. ..... Brainerd
Pedersen, Roy C. ..... Duluth
Peluso, Charles R. ..... Minneapolis
Pelzl, Charles ..... Pine River
† Pemberton, John deJ. ..... Rochester
Penk, Engward L. ..... Springfield
Penn, George E. ..... Mankato
† Pennie, Daniel F. V. ..... Duluth
† Peppard, Thomas A. ..... Minneapolis
Perkins, Douglass E. ..... Alexandria
Perlman, Everett C. ..... Minneapolis
Perlman, Herschel L. ..... Minneapolis
Perry, Harold ..... Rochester
Person, John P. ..... Albert Lea
Pertl, Albert L. ..... Canby
Peteler, Jennings C. J. ..... Minneapolis
Peters, Gustavus A. ..... Rochester
Petersen, Bryon D. ..... Minneapolis
Petersen, Deane A. ..... Minneapolis
Petersen, Donald H. ..... Northfield
Petersen, Glenn L. ..... Minneapolis
Petersen, Magnus C. ..... Rochester
Petersen, Peter C. ..... Minneapolis
Petersen, Robert T. ..... St. Cloud
Petersen, William E. ..... Minneapolis
Peterson, Alvin C. ..... Mora
Peterson, David B. ..... St. Paul
Peterson, Donald B. ..... Anoka
Peterson, Donald H. ..... St. Paul
Peterson, Edward A. ..... St. Paul
Peterson, Edward N. ..... Virginia
Peterson, Harold O. ..... St. Paul
Peterson, Henry ..... Minneapolis
Peterson, Herbert W. ..... Minneapolis
Peterson, Joel L. E. ..... St. Paul
Peterson, John H. ..... Duluth
Peterson, Kenneth A. ..... Marshall
Peterson, Kenneth H. ..... Hutchinson
Peterson, Lowell F. A. ..... Rochester
Peterson, Nordahl P. ..... Minneapolis
Peterson, Oliver H. ..... Minneapolis
Peterson, Oliver H., Jr. ..... Minneapolis
Peterson, Palmer A. ..... Minneapolis
† Peterson, Peter E. ..... Minneapolis
Peterson, Roy A. ..... Vesta
Peterson, Roy L. ..... White Bear Lake
Peterson, Stanley C. ..... Austin
Peterson, W. H. ..... Austin
Peterson, Willard C. ..... Minneapolis
Peterson, Willard E. ..... Willmar
Petit, Julien V. ..... Minneapolis
† Petit, Leon J. ..... Minneapolis
Petraborg, Harvey T. ..... Aitkin
Pettersen, George R. ..... Aitkin
Pettet, John R. ..... North Hollywood, Calif.
Pewters, John T. ..... Minneapolis
Peyton, William T. ..... Minneapolis
Phares, Otto C. ..... St. Cloud
† Phelphs, Kenneth A. ..... Menlo Park, Calif.
Phillips, Leonard ..... St. Paul
Phillips, William M. ..... Jackson, Tenn.
Philp, David R. ..... Watertown
Pierce, Charles H. ..... Wadena
Pierce, Jack R. ..... Williamson, W. Va.
Pierce, Robert B. ..... Renville
Pierson, Roy F. ..... Slayton
Pincus, Mitchell ..... Minneapolis
Piper, Charles J., Jr. ..... Rochester
† Piper, Monte C. ..... La Canada, Calif.
† Piper, William A. ..... Mountain Lake
Plasha, Matthew K. ..... Anoka
Plass, Herbert F. R. ..... Minneapolis
Plimpton, Nathan C., Jr. ..... Minneapolis
Plotke, Harry L. ..... St. Paul
Plott, Carol L. ..... Heron Lake
Plucker, Milton W. ..... Worthington
Plum, George E. ..... Rochester
Pohl, John F. M. ..... Minneapolis
† Poirier, Joseph A. ..... Forest Lake
Pollak, Kurt ..... Minneapolis
Pollard, William S. ..... Duluth
Polley, Howard F. ..... Rochester
Pollock, Anthony J. ..... Minneapolis
† Pollock, David K. ..... Minneapolis
Polski, Paul G. ..... So. St. Paul
Polzak, Jacob A. ..... Minneapolis
Pone, John ..... Cambridge
Ponterio, James E. ..... Shakopee
Pool, Thomas L. ..... Rochester
Popadiuk, Peter ..... Minneapolis
Popovich, Dragojla ..... Anoka
† Poppe, Frederick H. ..... Coral Gables, Fla.
† Porter, Oliver M. ..... Minneapolis
Posey, John W. ..... Rochester
Post, Edmund A. ..... St. Paul
Potter, Paul H. ..... Duluth
Potter, Robert B. ..... Minneapolis
Potts, L. C. ..... Warroad
Power, John E. ..... Duluth
Power, John E., Jr. ..... Duluth
† Pratt, Fred J., Sr. ..... Minneapolis
Pratt, Fred J., Jr. ..... Minneapolis
Pratt, Joseph H., Jr. ..... Rochester
† Preine, Irving A. ..... Osseo
† Preisinger, Joseph W. ..... Dallas, Texas
Prentice, Walter B. ..... St. Paul
Prem, Konald A. ..... Minneapolis
† Preston, Paul J. ..... Minneapolis
Price, William Edmund ..... Minneapolis
Prickman, Louis E. ..... Rochester
Priest, Robert E. ..... Minneapolis
Priestley, James T. ..... Rochester
† Prim, Joseph A. ..... Minneapolis
Prins, Leo R. ..... Albert Lea
Prlina, Isaac M. ..... Virginia
Proeschel, Ray K. ..... Willmar
Proffitt, William E. ..... Minneapolis
Proud, Harry S. ..... St. Paul
Pruitt, Raymond D. ..... Rochester
Pugh, David G. ..... Rochester
Pumala, Erven E. ..... Warren
Purnell, Don C. ..... Rochester
Purves, G. Harland ..... Buffalo
Puumala, Reino H. ..... Cloquet

Quanstrom, Virgil E. ..... Brainerd
Quast, John E. ..... Long Prairie
Quattlebaum, Frank W. ..... St. Paul
Quello, Robert O. B. ..... Minneapolis
Quetsch, Richard M. ..... Rochester
Quiggle, Arthur B. ..... Minneapolis
Quist, Henry W., Jr. ..... Minneapolis

Raaen, Olaf ..... St. Paul
Raattama, John W. ..... Keewatin
Rabcevich, Anatole ..... St. Paul
Racer, Harley J. ..... Minneapolis
Raetz, Sylvester J. ..... Maple Lake
Ragen, Patrick A. ..... Seattle, Washington
Raile, Richard B. ..... Minneapolis
Rajala, Arnold I. ..... Grand Rapids
Ralph, James R. ..... St. Paul
Ralston, Donald E. ..... Rochester
Ramlow, Ralph M. ..... St. Paul
Ramsdell, John A. ..... Rochester
† Ramsey, Walter R. ..... St. Paul
Randall, Lawrence M. ..... Rochester
Randall, Raymond V. ..... Rochester
Ransom, H. Robert ..... Osseo
† Ransom, Matthias L. ..... Hancock
Rasmussen, Ramby C. ..... St. Paul
Ratelle, Alexander E. ..... Minneapolis
Ravits, Harold G. ..... St. Paul
Rea, Charles E. ..... St. Paul
Reardon, Andrew E. ..... Duluth
Reed, Henry H. ..... Duluth
Reed, Paul ..... Virginia
Reed, Sheldon C. ..... Minneapolis
Reff, Alan R. ..... Crookston
Regan, John J. ..... Minneapolis
Regnier, Edward A. ..... Minneapolis
Reichelderfer, Charles F. ..... Staples
Reichelt, Leland G. ..... Wadena
Reid, James W. ..... South St. Paul
Reif, Harold A. ..... Minneapolis
Reif, Henry J. ..... St. Cloud
Reif, Robert W. ..... White Bear Lake
Reiley, Richard E. ..... Minneapolis
Reinhardt, James H. ..... Alexandria
Reiser, Milton P. ..... Minneapolis
Reitemeier, Richard J. ..... Rochester
Remine, William H., Jr. ..... Rochester
Remole, William D. ..... Minneapolis
Remsberg, Robert R. ..... Tracy
† Replogle, William H. ..... Los Angeles, Calif.
Resch, Joseph A. ..... Minneapolis
Restall, Charles J. ..... Rochester
† Reuland, John J. ..... Rochester
Reynolds, Donald P. ..... Minneapolis
† Reynolds, William A. ..... New York, N. Y.
Rhoads, Donald V. ..... Rochester
Rholl, Arnold O. ..... Minneapolis
Rice, Carl O. ..... Minneapolis
Rice, Frank B. ..... Robbinsdale
Rice, Fred A. ..... Minneapolis
Rice, Hagbart G. ..... Moorhead
Richards, Albert M. ..... St. Paul
Richards, Ernest T. F. ..... St. Paul
Richards, William B. ..... St. Cloud
Richardson, Edward J., Jr. ..... St. Paul
Richardson, Robert J. ..... St. Paul
Richdorf, Lawrence F. ..... Minneapolis
Richter, David J. ..... Virginia
Rick, Paul F. W. ..... St. Paul
Rieke, Wellington W. ..... Wayzata
Rieschl, Elizabeth K. ..... Jordan
Rimas, Matthew J. ..... Comfrey
Ringle, Otto F. ..... Walker
Rinkey, Eugene ..... St. Paul
Riordan, Elsie M. ..... Minneapolis
Ripple, Rudolph J. ..... St. Paul
Risch, Ronald E. ..... Minneapolis
Risser, Alden F. ..... Stewartville
Ritchie, Wallace P. ..... St. Paul
Ritt, Albert E. ..... St. Paul
‡ Ritzinger, Frederick R. ..... Gowrie, Iowa
† Rivers, Morris H. ..... Rochester
Rizer, Dean K. ..... Minneapolis
† Rizer, Robert I. ..... Wayzata
Roach, Donald E. ..... St. Paul
Roan, Orville M. ..... Ellendale
Robb, Edwin F. ..... Minneapolis
† Robbins, Charles P. ..... Winona
Robbins, Mason C. ..... St. Paul
Robbins, Owen F. ..... Minneapolis
Roberts, Byron H. ..... Minneapolis
Roberts, Frank E. ..... Rochester
Roberts, George A. ..... Austin
Roberts, Lewis J. ..... Minneapolis
Roberts, Oliver W. ..... Owatonna
Roberts, Stanley W. ..... Minneapolis
Robertson, Paul A. ..... Austin
Robilliard, Charles M. ..... Faribault
Robinett, Robert W. ..... Worthington
Robinson, Cortland O. ..... Minneapolis
Rock, William H. ..... Anoka
Rocknem, Robert E. ..... Minneapolis
Rockwell, Curtiss V. ..... Minneapolis
Rockwood, Philo H. ..... Fergus Falls
† Rodda, Frederick C. ..... Minneapolis
Rodgers, Richard S. ..... Minneapolis
Rodling, Herbert ..... Rochester
Roehlke, Arthur B. ..... Elk River
Roemer, Henry J. ..... Winona
Rogers, Charles W. ..... Winona
Rogin, Norton ..... Minneapolis
Rogne, W. Gustav ..... Spring Grove
Roholt, Christian L. ..... McIntosh
Roholt, Hartvig B. ..... Fosston
Rohrer, Christian A. ..... Worthington
Rolig, David H. ..... St. Paul
Rollie, Orris O. ..... St. Paul
Rollins, Pat ..... Wayzata
Rome, Howard P. ..... Rochester
Romness, Kenneth B. ..... Mound
Rooke, Edward D. ..... Rochester
Rorem, Joseph A. ..... Appleton
Rose, John T. ..... Lakefield
Rosenbaum, David L. ..... Minneapolis
Rosendahl, Frederick G. ..... Minneapolis
Rosenfield, Abraham B. ..... Minneapolis
Rosenow, John H. ..... Minneapolis
Rosenthal, F. Harold ..... Austin
Rosenthal, Robert ..... St. Paul
† Rosenwald, Reuben M. ..... Coon Rapids
Ross, Alexander J. ..... Minneapolis
Ross, Griff T. ..... Rochester
Ross, James V., Jr. ..... Rochester
Ross, Margaret ..... Rochester
Rossberg, Raymond A. ..... Morris
Rossen, Ralph X. ..... Minneapolis
Rossing, Robert G. ..... St. Paul
Rotenberg, Robert J. ..... Minneapolis
Roth, Fredrick D. ..... Mankato
Roth, George C. ..... St. Paul
‡ Roth, Harry L. ..... Rochester
Rothnem, Morris S. ..... Minneapolis
† Rothschild, Harold J. ..... St. Paul
Roust, Henry A. ..... Montevideo
Rovelstad, Randolph A. ..... Rochester
† Rovelstad, Roger A. ..... Yonkers, N. Y.
Rowe, Clarence J., Jr. ..... St. Paul
† Rowe, Olin W. ..... Duluth
† Rowland, Spencer A. ..... Rochester
Rowles, Everett K. ..... Coleraine
Roy, Phil C. ..... St. Paul
Rozycki, Anthony ..... St. Cloud
Ruchie, Warren H. ..... Willmar
Rucker, Charles W. ..... Rochester
Rucker, W. Henry ..... Minneapolis
Rud, Norman E. ..... Minneapolis
† Rudell, Gustave L. ..... Minneapolis
Rudie, Peter S. ..... Duluth
* Rudie, Clifford N. ..... St. Peter
Rudie, William D. ..... Duluth
Ruggles, George M. ..... Forest Lake
† Ruhberg, George N. ..... Santa Barbara, Calif.
Rukavina, John G. ..... St. Paul
Rumpf, Carl W. ..... Faribault
Runquist, John M. ..... Duluth
Runquist, Richard K. ..... Anoka
Rushing, Lige B., Jr. ..... Rochester
Rushton, Joseph G. ..... Rochester
Russ, Homer H. ..... Blue Earth
Russell, Marion F., Jr. ..... Great Bend, Kan.
Russeth, Arthur N. ..... Minneapolis
Rusten, Elmer M. ..... Minneapolis

Rusterholz, Alan P. ..... St. Paul
Ruth, Bradley R. ..... Duluth
Rutledge, John B. ..... Detroit Lakes
Rutledge, Lloyd H. ..... Detroit Lakes
† Ryan, John J. ..... St. Paul
Ryan, Joseph M. ..... St. Paul
Ryan, William J. ..... Duluth
Rydburg, Wayne C. ..... Minneapolis
Ryding, Vincent ..... Mountain Lake
Rydland, Arne D. ..... Minneapolis
Rygh, Harold N. ..... Atwater
Rynda, Edwin R. ..... New Prague
Rynearson, Edward H. ..... Rochester
Rysgaard, George N. ..... Northfield

St. Cyr, Harry M., Jr. ..... Robbinsdale
St. Cyr, Kenneth J. ..... Robbinsdale
Sach-Rowitz, Alvan ..... Moose Lake
Sadler, William P. ..... Minneapolis
Saffert, Cornelius A. ..... Minneapolis
‡ Safirescu, Sorin R. ..... Minneapolis
Sager, Stanley M. ..... Rochester
Sahr, Walter G. C. ..... Hutchinson
Salassa, Robert M. ..... Rochester
Saliterman, Bernard I. ..... Minneapolis
Salk, Richard J. ..... Albany
Salter, Reginald A. ..... Virginia
Samuelson, L. Gordon ..... St. Peter
Sanchez, James J. ..... Rochester
Sandeen, Robert M. ..... Buffalo
† Sanderson, Anton G. ..... Ashby
Sanderson, David J. ..... Fergus Falls
Sandt, Karl E. ..... Minneapolis
† Sandven, Nels O. ..... Paynesville
Sanford, John B. ..... Duluth
*† Sanford, Arthur H. ..... Rochester
Sanford, Raymond A. ..... Mankato
† Sarff, Oliver E. ..... Duluth
Sargent, Edward C., Jr. ..... Austin
Sarnecki, M. M. ..... St. Paul
† Sasano, Joseph R., Jr. ..... Rochester
† Satersmoen, Theodore ..... Pelican Rapids
Sather, Edgar L. ..... Fosston
Sather, Edgar R. ..... Alexandria
Sather, George A. ..... Fosston
Sather, Richard N. ..... Fosston
Sather, Russell O. ..... Crookston
Satterlee, Howard W. ..... Lewiston
† Satterlund, Victor L. ..... New Richmond, Wisconsin
Sauer, William G. ..... Rochester
Sawayniuk, Iwan ..... Waconia
*† Savage, Francis J. ..... St. Paul
Sawatzky, William A. ..... Minneapolis
Sawtell, Robert R. ..... Worthington
Sax, Milton H. ..... Duluth
Sax, Simon G. ..... Duluth
Saxman, Gertrude E. O. ..... Georgetown
Sayre, George P. ..... Rochester
Sborov, Abe M. ..... Minneapolis
Scallen, Raymond W. ..... Minneapolis
Scanlon, Paul W. ..... Rochester
Schaaf, Frederick H. K. ..... Minneapolis
Schaar, Frances E. ..... Minneapolis
Schade, Frederick L. ..... Worthington
Schaefer, Joseph C. ..... Rochester
Schaefer, Joseph F. ..... Owatonna
Schaefer, Kenneth F. ..... Minneapolis
Schaefer, Wesley G. ..... Minneapolis
Schafer, Thomas L. ..... Minneapolis
Schaffhausen, Irwin F. ..... Minneapolis
Schaffhausen, Mildred ..... Minneapolis
Schamber, Walter F. ..... Parkers Prairie
Scheidel, Alois M. ..... Mankato
Scheifley, Charles H. ..... Rochester
† Scheldrup, N. H. ..... Minneapolis
Scherer, Leslie R. ..... Minneapolis
Scherling, Sidney S. ..... Minneapolis
Scheuneman, Allen F. ..... Warroad
Schiele, Burtrum C. ..... Minneapolis
Schimelpfenig, George T. ..... Chaska
Schirber, Martin J. ..... Grand Rapids
Schirger, Alexander ..... Rochester
Schissel, Gregory A. ..... Minneapolis
Schmid, John F. ..... Duluth
Schmidt, Herbert W. ..... Rochester
Schmidt, Hilmar R. ..... Rushford
† Schmidt, Paul A. ..... Aurora, Illinois
Schmidt, Paul G., Jr. ..... Granite Falls
Schmidt, Ruben F. ..... Alden
Schmidt, W. Robert ..... Minneapolis
Schmidtke, Reinhardt L. ..... St. Paul
† Schmitt, S. C. ..... Los Angeles, Calif.
Schmitz, Anthony A. ..... Mankato
Schmitz, Everett J. ..... St. Cloud
Schnabel, Robert F. ..... Crookston
Schneck, Jack I. ..... Minneapolis
Schneider, Lawrence E. ..... Duluth
Schneider, Paul J. ..... Adams
Schnell, Frederick S. ..... Litchfield
† Schoch, Robert B. J. ..... St. Paul
Schoeneberger, P. B. ..... Perham
† Scholpp, Otto W. ..... Hutchinson
Scholz, Donald A. ..... Rochester
Schons, Edward ..... St. Paul
Schossow, George W. ..... Erskine
Schottler, Max E. ..... Minneapolis
† Schroder, Charles H. ..... Pottstown, Penn.
Schroeckenstein, Hugo F. ..... St. Paul
Schroeder, Albert J. ..... Minneapolis
Schroeppel, John E. ..... Winthrop
Schulberg, Verne A. ..... Gaylord
† Schuldt, Frederick C. ..... St. Paul
Schultz, Alvin L. ..... Minneapolis
Schultz, Earl A. ..... Minneapolis
Schultz, J. Harold ..... Minneapolis
*† Schultz, J. Albert ..... Albert Lea
Schultz, Peter J. ..... Minneapolis
Schulz, Robert W. ..... Fairmont
† Schulze, Albert G. ..... St. Paul
Schulze, William M. ..... Minneapolis
Schumacher, John W. ..... Minneapolis
Schut, John W. ..... Anoka
Schutz, Elmer S. ..... Mountain Lake
Schwartz, Carl A. ..... Austin
Schwartz, E. Robert ..... Minneapolis
Schwartz, John T. ..... Rochester
Schwartz, Virgil J. ..... Minneapolis
Schweiger, Theodore R. ..... Hibbing
Schwyzer, Hanns C. ..... St. Paul
Schwyzer, Marguerite ..... St. Paul
Scott, Eugene E. ..... St. Paul
Scott, Horace G. ..... Minneapolis
Scott-Miller, James R. ..... Rochester
Scudamore, Harold H. ..... Rochester
† Seaberg, John A. ..... Pequot Lakes
Seashore, Rosel T. ..... Duluth
Seay, James E., III ..... Rochester
‡ Sebrechts, Paul ..... Great Lakes, Ill.
Seery, Thomas M. ..... Austin
Segal, Martin A. ..... Minneapolis
Seifert, Milton H. ..... Excelsior
Seifert, Otto J. ..... New Ulm
Sekanina, Jan ..... Babbitt
Sekhon, Mohan S. ..... St. Paul
Selck, Wolfgang T. E. ..... Fergus Falls
Seldon, Thomas H. ..... Rochester
Selmo, Joseph D. ..... Norwood
Semler, Herbert J. ..... Rochester
Semsch, Robert D. ..... Minneapolis
† Senn, Edward W. ..... Owatonna
Sethre, Arthur E. ..... Fergus Falls
Setzer, Hobert J. ..... St. Paul
Shandorf, James F. ..... Minneapolis
Shannon, William R. ..... St. Paul
Shaperman, Eva P. ..... Minneapolis
Shapiro, Irving ..... Minneapolis
Shapiro, Sidney K. ..... Minneapolis
Sharp, David V. ..... Minneapolis
Shaver, Ward ..... Fergus Falls
Shaw, Howard A. ..... Minneapolis
Shea, Andrew W. ..... Minneapolis
Sheedy, Chester Leo ..... Austin
Sheeley, William F. ..... Minneapolis
Shelander, Marcus I. ..... St. Paul
† Shellman, John L. ..... Pacific Palisades, Calif.
Sheppard, Charles G. ..... Hutchinson
Sher, David A. ..... Virginia
Sher, Lewis ..... Minneapolis
Sherman, Alfred G. ..... Albert Lea
Sherman, Carnot H. ..... Bayport
Sherman, Charles L. ..... Luverne
Sherman, Lloyd F. ..... Minneapolis
Sherman, Morris H. ..... Minneapolis
Sherman, Royal V. ..... Red Wing
‡ Sherrick, Donald W. ..... Fort Ord, Calif.
Shick, Richard M. ..... Rochester
Shillington, Maurice A. ..... Brainerd
Shin, Rok W. ..... Grand Meadow
Shragg, Robert I. ..... Minneapolis
* Short, Jacob ..... St. Paul
Shronts, John F. ..... Minneapolis
Sidell, Franklin D. ..... Minneapolis
Siegel, Clarence ..... St. Paul
Siegel, John S. ..... Virginia
Siegmann, William C. ..... Minneapolis
Siekert, Robert G. ..... Rochester
Silas, Ralph M. ..... Minneapolis
Silver, Arthur W. ..... Rock
Silver, John D. ..... Minneapolis
† Silverstein, Murray N. ..... Rochester
‡ Silvis, Stephen E. ..... San Francisco, Calif.
Simison, Carl ..... Barnesville
Simmonds, Harry N. ..... Prior Lake
Simons, Bernard H. ..... Chaska
* Simons, Edwin J. ..... Edina
† Simons, Jalmar H. ..... Minneapolis
Simons, Leander T. ..... St. Paul
Simonson, Donald B. ..... Minneapolis
Simonton, Kinsey M. ..... Rochester
† Simpson, Ellery De W. ..... Asheville, N. C.
Sinamark, Andrew ..... Hibbing
Singbeil, J. H. ..... Breckenridge
Singer, Benjamin J. ..... St. Paul
Sinykin, Melvin B. ..... Minneapolis
Sipe, James W. ..... Coon Rapids
Siperstein, David M. ..... Minneapolis
Sisk, Harvey E. ..... St. Cloud
Sisler, Clifford E. ..... Minneapolis
Sjoding, J. Donald ..... Mankato
Sjostrom, Lawrence E. ..... St. Peter
Skaife, William F. ..... Benson
Skaug, Harold M. ..... Chatfield
Skinner, Abbott ..... St. Paul
† Skinner, Harvey O. ..... St. Paul
Skjold, Arthur C. ..... Minneapolis
Skogerboe, Rudolph B. ..... Karlstad
† Skworcow, George ..... Minneapolis
Slater, Sidney A. ..... Worthington
Slocumb, Charles H. ..... Rochester
Smiley, John T. ..... Minneapolis
Smisek, Elmer A. ..... St. Paul
Smisek, Frank M. E. ..... Minneapolis
Smith, Adam M. ..... Minneapolis
Smith, Archie M. ..... Minneapolis
Smith, Baxter A., Jr. ..... Minneapolis
Smith, Cyril M. ..... Duluth
† Smith, Don V. ..... Mercer Island, Wash.
† Smith, Frederick L. ..... Rochester
Smith, George R. ..... Hutchinson
Smith, Graham G. ..... Minneapolis
Smith, Harry J. ..... Lake Crystal
† Smith, Harry L. ..... Rochester
‡ Smith, John H. ..... Augusta, Georgia
Smith, Lloyd A. ..... Willmar
Smith, Lucian ..... Rochester
† Smith, Margaret I. ..... Gardena, Calif.
† Smith, Myron W. ..... Red Wing
Smith, Nadine G. ..... Minneapolis
Smith, Norvin R. ..... Willmar
Smith, Paul M. ..... Lake Crystal
Smith, Ralph E. ..... Rochester
Smith, Reginald A. ..... Rochester
Smith, Theodore S. ..... Minneapolis
Smith, Thorsten ..... Faribault
Smith, Vernon D. E. ..... St. Paul
Smith, Wallace R. ..... Grand Marais
Smith, William G. ..... El Paso, Texas
Smith, William T. ..... Minneapolis
Smorstok, Matthew B. ..... Monticello
Smythe, Lowell J. ..... Austin
Smyth, John J. ..... Lester Prairie
Snider, Howard R. ..... Mankato
Snyder, Clifford D. ..... Kiester
Snyder, George W. ..... St. Paul
Snyker, Omer E. ..... Ely
Soderberg, Richard J. ..... Grand Marais
Soderlind, Ragnar T. ..... Minneapolis
Sohlberg, Olof I. ..... St. Paul
Solhaug, Samuel B. ..... Minneapolis
Solhaug, Samuel B., Jr. ..... Minneapolis
† Solsem, Frederick N. S. ..... Spicer
Solvason, Harold M. ..... Minneapolis
Sommerdorf, Vernon L. ..... St. Paul
Sommers, Ben ..... St. Paul
Sommerville, Robert L. ..... Rochester
† Sones, Donald A. ..... Rochester
Sonnesyn, Nels N. ..... Le Sueur
Sontag, David W. ..... Lake City
Sorem, Milton B. ..... St. Paul
Soucheray, Philip H. ..... St. Paul
Souders, John C. ..... Rochester
Soule, Edward H. ..... Rochester
Souster, Benjamin B. ..... St. Paul
Sowada, Ernest J. ..... St. Paul
Spain, W. Thomas ..... Richmond, Va.
Spang, Anthony J. ..... Duluth
Spang, James S. ..... Duluth
Spang, William M. ..... Duluth
Spano, Joseph P. ..... Minneapolis
Spencer, Bernard J. ..... Minneapolis
Spencer, Robert J. ..... Rochester
Sperl, Michael P., Jr. ..... St. Paul
Spieler, Forrest B. ..... Pequot Lakes
Spink, Wesley W. ..... Minneapolis
Spittel, John A., Jr. ..... Rochester
Sponsel, Kenath H. ..... Minneapolis
Sprafka, Gregory A. ..... St. Paul
Sprafka, Joseph L. ..... St. Paul
Sprague, Randall G. ..... Rochester
† Spratt, Charles N. ..... Minneapolis
Spurbeck, George H. ..... Bemidji
† Spurgeon, Frederick C. ..... Rochester
Spurzem, Raymond J. ..... Anoka
Stadem, Clifford J. ..... Twin Valley
Stahl, George W. ..... Austin
Stahler, Paul A. ..... Jordan
Stahr, Aubrey C. ..... Hopkins
Stam, John ..... Worthington
Stanford, Charles E. ..... Minneapolis
† Stangl, Philip E. ..... St. Cloud
† Stanley, Court R. ..... Minneapolis
Starekow, Milton D. ..... Thief River Falls
Staub, Henry P. ..... Minneapolis
Stauffer, Maurice H. ..... Rochester
Steffens, Leon A. ..... Red Wing
Stein, Raymond J. ..... Pierz
Stein, William A. ..... Duluth, Minnesota
Steinberg, Charles L. ..... St. Paul
Steiner, Leon E. ..... Albert Lea
Steinhilber, Richard M. ..... Rochester
Stelter, Lloyd A. ..... Minneapolis
Stemsrud, Harold L. ..... Alexandria

Stennes, John L. ..... Minneapolis
Stensgaard, Kermit L. ..... Thief River Falls
† Stemstrom, Annette T. .. Marine-on-St. Croix
Stephens, William E. ..... Minneapolis
Sterner, Donald C. ..... St. Paul
Sterner, Ernest R. ..... St. Paul
Sterner, John J. ..... St. Paul
Sterrie, Norman A. ..... Minneapolis
Stevenson, Basil M. ..... Fulda
† Stewart, Alexander ..... St. Paul
Stewart, Donald E. ..... Crookston
Stewart, Marvin J. ..... Minneapolis
Stewart, Rolla I. ..... Minneapolis
Stickney, J. M. ..... Rochester
Stiegler, Farrell S. ..... Minneapolis
Stillwell, George K. ..... Rochester
Stillwell, Walter C. ..... Mankato
Stilwell, George G. ..... Rochester
Stoesser, Albert V. ..... Minneapolis
Stolen, Keith H. ..... Grand Rapids
Stolpestad, Armer H. ..... St. Paul
Stoltz, Robert C. ..... Minneapolis
Stoltze, Cynthia A. ..... Rochester
† Stomel, Joseph ..... Los Angeles, Calif.
Stone, Norman F. ..... Minneapolis
Stone, Stanley P. ..... Minneapolis
Stool, Newson ..... Rochester
Stormont, James R. ..... Rochester
Storsteen, Kenneth A. ..... Duluth
Stoy, Robert A. ..... Little Falls
Strand, Jack W. ..... St. Paul
Stransky, Theodore W. ..... Owatonna
Strate, Gordon E. ..... St. Paul
Strathern, Carleton S. ..... St. Peter
† Strathern, Fred P. ..... St. Peter
† Strathern, Moses L. ..... Gilbert
Stratte, Alf K. ..... Pine City
Stratte, Harold C. ..... Windom
Strauchler, Jonas ..... Belview
Straus, Maurice L. ..... St. Paul
Street, Bernard ..... Northfield
Streitz, John M. ..... Duluth
Strem, Edward L. ..... St. Paul
Strewler, Gordon J. ..... Duluth
Strickler, Jacob H. ..... Minneapolis
Stroebel, Charles F., Jr. ..... Rochester
Strom, Gordon W. ..... Minneapolis
Stromgren, Delph T. ..... Minneapolis
Stromme, William B. ..... Minneapolis
Strunk, Clarence A. ..... Minneapolis
Student, Richard E. ..... Eveleth
Studer, Donald J. ..... Faribault
Stuhr, John W. ..... Stillwater
Sturges, Robert L. ..... Minneapolis
Sturgis, John A. ..... Lamberton
Sturley, Rodney F. ..... St. Paul
Subak, Barbara H. ..... Minneapolis
† Subby, Walter ..... Wayzata
Sukov, Marvin ..... Minneapolis
Sullivan, Charles R. ..... Rochester
Sullivan, Raymond M. ..... Minneapolis
Sullivan, William A., Jr. ..... Minneapolis
Summar, M. Thomas ..... Virginia
Sundberg, Arthur B. ..... Blue Earth
Sutherland, Harry N. ..... Ely
† Sutherland, W. H. ..... Denver, Colorado
Svien, Hendrik J. ..... Rochester
† Swanson, John A. ..... St. Paul
Swanson, Lawrence J. ..... St. Paul
Swanson, Ralph H. ..... St. Paul
Swanson, Roy E. ..... Minneapolis
Swanson, Wallace L. ..... Minneapolis
Swedberg, William A. ..... Duluth
Swedenburg, Paul A. ..... Glenwood
† Swedlund, Harry A. ..... Rochester
Sweetser, Horatio B. ..... Minneapolis
Sweetser, Theodore H. ..... Minneapolis
Sweetser, Theodore H., Jr. ..... Minneapolis
† Sweitzer, Samuel E. ..... Minneapolis
† Swendseen, Carl G. ..... Minneapolis
Swendseen, Carl J. ..... Graceville
Swendson, James J. ..... St. Paul
Swenson, Arnold O. ..... Duluth
Swenson, Donald Bjork ..... St. Paul
Swenson, Donald Burton ..... Mankato
Swenson, Orvie J. ..... Waseca
Swenson, Paul C. ..... St. Paul
Swenson, Richard W. ..... Hibbing
Swenson, Roy G. ..... North Branch
Symmonds, Richard E. ..... Rochester
Syverton, Jerome T. ..... Minneapolis

Taintor, Ronald W. ..... Marshall
Tam, Ernest C. ..... Minneapolis
† Tama, Lawrence ..... Rochester
Tangen, George M. ..... Minneapolis
Tani, George T. ..... St. Paul
Tanquist, Edwin J. ..... Alexandria
Taswell, Howard F. ..... Rochester
Taufic, Mansur ..... Austin
Tauxe, Welby N. ..... Rochester
Taylor, Joseph H. ..... Minneapolis
† Taylor, Lawrence C. ..... Rochester
Taylor, William E. ..... Minneapolis
Teeter, Richard R. ..... Wauwatosa, Wis.
Teich, Kenneth W. ..... Duluth
Teisberg, John E. ..... St. Paul
Tenner, Robert J. ..... Minneapolis
Terrell, Bernard J. ..... Nopeming
Tesar, Charles E. ..... New Ulm
Tesch, Gordon H. ..... Elk River
Testor, James V. ..... Winona
Tetlie, James P. ..... Duluth
Textor, Jerome ..... Anoka
Thal, Alan P. ..... Minneapolis
Thayer, Ellsworth A. ..... Fairmont
Theobalt, Inge M. ..... Minneapolis
Thielen, Robert D. ..... St. Michael
Thiem, Chester E. ..... Mankato
Thill, Leonard J. ..... Balaton
Thomas, John V. ..... Duluth
Thomas, Juergen E. ..... Rochester
Thomes, A. Boyd ..... Minneapolis
Thompson, A. Henry ..... St. Peter
Thompson, Arthur ..... Minneapolis
Thompson, Carl O. ..... Hendricks
Thompson, Floyd A. ..... St. Paul
Thompson, Gershom J. ..... Rochester
† Thompson, John W., III ..... Rochester
Thompson, Russell A. ..... Cosmos
Thompson, Willis H. ..... Minneapolis
Thomson, James M. ..... Austin
Thoreson, M. C. Bernice ..... So. St. Paul
Thorsen, David S. ..... Minneapolis
Thorsgard, Ernest ..... Thief River Falls
Thorson, Stuart V. ..... Minneapolis
Thouin, Laurence G. ..... Hibbing
† Thurber, Deloran L. ..... Rochester
Thuringer, Carl B. ..... St. Cloud
Thysell, Desmond M. ..... Minneapolis
† Thysell, Fred A. ..... Moorhead
Thysell, Harold R. ..... Crookston
Thysell, Vernon D. ..... Hawley
Tiffany, Francis B. ..... St. Paul
Tifft, Cyril R. ..... St. Paul
Tillisch, Jan H. ..... Rochester
Tinkham, Robert G. ..... Minneapolis
Titrud, Leonard A. ..... Minneapolis
Tobin, John D. ..... Minneapolis
Todd, Thomas N. F. ..... Minneapolis
Tongen, Lyle A. ..... St. Paul
Torghele, John R. ..... Hastings
Tosseland, Noel E. ..... Duluth
Trach, Benedict B. ..... Minneapolis
Traeger, Carl A. ..... Faribault
Trautmann, James C. ..... Duluth
Travis, James S. ..... St. Paul
Traxler, J. Felix ..... Henderson
Tregilgas, Harold R. ..... South St. Paul
Tregilgas, Richard B. ..... St. Paul
† Troost, Henry B. ..... Mankato
Trow, James E. ..... Minneapolis
Trow, William H. ..... Minneapolis
Trueman, Harold S. ..... Minneapolis
Truesdale, Clark W. ..... Glencoe
Tsai, Shih Hao ..... Oak Terrace
Tucker, Richard C. ..... Minneapolis
Tudor, Richard B. ..... Minneapolis
‡ Tuffanelli, Denny L. ..... New York, N. Y.
† Tuohy, Edward L. ..... Santa Barbara, Calif.
† Turnacliff, Dale D. ..... St. Paul
Tuura, James L. ..... Duluth
Tweedy, John A. ..... Winona
Twidwell, Joseph E. ..... Minneapolis
Twiggs, Leo F. ..... Austin
Twomey, John E. ..... Minneapolis

Ubel, Frank A. ..... St. Paul
Uhley, Charles G. ..... Crookston
Uihlein, Alfred ..... Rochester
Ulrich, Emery E. ..... Crosby
† Ulrich, Henry L. ..... Minneapolis
Ulvestad, Harold S. ..... Minneapolis
Undem, Dale ..... St. Cloud
Underdahl, Laurentius O. ..... Rochester
† Undine, Clyde A. ..... Minneapolis
† Urban, F. Henry ..... Rochester
Utendorfer, Robert W. ..... Minneapolis
Utz, David C. ..... Rochester
Utz, Philip H. ..... LaCrescent

Vaaler, Robert T. ..... Cokato
† Vadheim, Alfred L. ..... Tyler
† Valentine, Walter H. ..... Tracy
Valgemae, Romil ..... Minneapolis
Van Bergen, Frederick H. ..... Minneapolis
Van Cleve, Horatio P., Jr. ..... Austin
Vanderpool, Thomas E. ..... Paynesville
Vandersluis, Charles W. ..... Bemidji
Van Herik, Martin ..... Rochester
Van Meier, Henry ..... Stillwater
Van Puffelen, Paul S. ..... Duluth
Van Rooy, George T. ..... Thief River Falls
Van Ryzin, Donald J. ..... Duluth
Varco, Richard L. ..... St. Paul
Vaughan, Victor M. ..... Truman
Vaughn, C. Gordon ..... St. Paul
Vaughn, Louis D. ..... Rochester
Veinbergs, Arnolds ..... Minneapolis
Veirs, Dean M. ..... St. Paul
Veirs, Ruby J. S. ..... St. Paul
† Venables, Alexander E. ..... Ely
Vennes, Jack A. ..... Minneapolis
Veranth, Leonard A ..... St. Cloud
Verby, John E., Jr. ..... Rochester
Vezina, John C. ..... Mapleton
Vik, A. Elliott ..... Minneapolis
Vik, Melvin ..... Cambridge
‡ Viren, Fred K. ..... Rochester
Virnig, Hildegard J. ..... Caledonia
Virnig, Mark P. ..... Wells
Virnig, Richard P. ..... Wells
Vix, Vernon A. ..... Worthington
* Vitols, T. M. ..... Minneapolis
Vogel, Howard A. L. ..... New Ulm
Vollmer, Frederick J. ..... Winona
Von Drasek, Joseph ..... Mankato
Von Drashek, Stanley C. ..... Minneapolis
† Von Heimburg, Roger L. ..... Rochester
Votel, Thomas W. ..... St. Paul

Waas, Charles W. A. ..... St. Paul
Wadsworth, George L. ..... Cambridge
† Wagener, Henry P. ..... Rochester
Wagner, Norman W. ..... Benson
Wagner, Robert M. ..... Minneapolis
Wagoner, James M. ..... Harmony
Wahlquist, Harold F. ..... Minneapolis
Wakefield, Elmer G. ..... Rochester
† Wakim, Khalil G. ..... Rochester
Walder, Harold J. ..... Duluth
Waldmann, Edward B. ..... Rochester
Waldron, Carl W. ..... Hopkins
Walfred, Karl A. ..... St. Cloud
† Walker, Alfred E. ..... St. Paul
Walker, Arthur E. ..... St. Paul
Wall, Carl R. ..... Minneapolis
Wall, James O. ..... St. Paul
Wallace, Helen M. ..... Minneapolis
Wallace, Martin O. ..... Duluth
† Waller, Joseph D. ..... Pine City
Wallinga, Jack ..... St. Paul
Walonick, Albert L. ..... St. Louis Park
Walsh, Edward F. ..... St. Paul
Walsh, Francis M. ..... Minneapolis
Walsh, William T. ..... Minneapolis
Walter, Clarence W. ..... St. Paul
Walter, Frederick H. ..... International Falls
Walter, William E. ..... Wanamingo
Walters, Waltman ..... Rochester
Wandke, Otto E. ..... Fairmont
Wangensteen, Owen H. ..... Minneapolis
Ward, Louis E. ..... Rochester
Ward, Percy A. ..... Minneapolis
Warner, James J. ..... Perham
Warren, Cecil A. ..... St. Paul
Warvel, John H., Jr. ..... Rochester
Wasmund, Clarence W. ..... Red Wing
Wasson, Loren F. ..... Alexandria
Watkins, Charles H. ..... Rochester
Watkins, John A. ..... Wells
Watson, Alexander M. ..... Royalton
Watson, C. Gordon ..... Minneapolis
Watson, Cecil J. ..... Minneapolis
Watson, John R. ..... Rochester
† Watson, Percy T. ..... Miami, Fla.
Watson, P. Theodore ..... St. Paul
Watson, Robert M. ..... Morris
Watson, Robert N. ..... Detroit Lakes
Watson, Sidney W. ..... Royalton
Watson, Virgil A. ..... Detroit Lakes
Watson, William H. A. ..... St. Paul
Watson, William J. ..... Newport
Wattenberg, Lee W. ..... Minneapolis
Watz, Clarence E. ..... St. Paul
Waugh, John M. ..... Rochester
Weatherhead, Donald S. P. ..... Minneapolis
¶ Weaver, Myron M. ..... Schenectady, N. Y.
Weaver, Paul H. ..... Faribault
† Weaver, Walt F. ..... Rochester
Webb, Edgar A. ..... Minneapolis
† Webb, Robert B., Jr. ..... Rochester
Webber, Fred L. ..... St. Paul
Webber, Richard J. ..... St. Louis Park
* Weber, Harry M. ..... Rochester
Weber, Lowell W. ..... Minneapolis
Wedes, Deno J. ..... St. Paul
Weed, Lyle A. ..... Rochester
Weeks, Richard E. ..... Rochester
Weidman, William H. ..... Rochester
† Weir, James F. ..... Rochester
Weir, Matthew J. ..... Virginia
Weis, Benjamin A. ..... St. Paul

Weisberg, Maurice ..... St. Paul
Weisberg, Rapheal J. ..... Minneapolis
Welch, John S. ..... Rochester
Wellman, William E. ..... Rochester
Wellner, Theodore O. ..... Rochester
Wells, Arthur H. ..... Duluth
Wells, Walter B. ..... Jackson
Wendland, John P. ..... Minneapolis
Wendt, H. P. ..... Thief River Falls
Wenner, Waldemar T. ..... St. Cloud
Wente, Harold A. ..... Rochester
† Wentworth, Albert J. ..... Mankato
Wenzel, Gilbert Paul ..... St. Paul
Werner, George ..... Minneapolis
Wesolowski, Stanley P. ..... Minneapolis
† West, Catherine C. ..... Minneapolis
Westby, Norval M. ..... Madison
† Westerman, Alvin E. ..... Montgomery
† Westerman, Fred C. ..... Montgomery
Westley, Kent F. ..... Little Falls
† Westlin, William F., Jr. ..... Rochester
Westover, Darrell E. ..... St. Paul
Westrup, John E. ..... Lanesboro
Wetherby, Macnider ..... Minneapolis
Weiteland, Thomas F. ..... St. Paul
Wetzel, Earl V. ..... St. Paul
Wexler, Harold M. ..... Minneapolis
Weyhrauch, William R. ..... Rochester
† Wheeler, Daniel W. ..... Fort Lauderdale, Fla.
Wheeler, Robert W. ..... Minneapolis
Whisnant, Jack Page ..... Rochester
Whitacre, John C., II ..... Minneapolis
Whitcomb, Fred F., Jr. ..... Rochester
White, Asher A. ..... Minneapolis
† White, James C. ..... Rochester
White, Robert J. ..... Rochester
† White, S. Marx ..... Minneapolis
White, Willard D. ..... Minneapolis
Whitesell, Lloyd A. ..... Minneapolis
Whitson, Sidney A. ..... Albert Lea
Whittemore, Dexter D. ..... Bemidji
Widen, Wilford F. ..... Minneapolis
Wikoff, Howard M. ..... Crookston
Wilbur, Dwight L., III. ..... San Francisco, California
Wilbur, Oscar M., Jr. ..... Hibbing
Wilcox, G. Charles ..... Albert Lea
Wild, John J. ..... Minneapolis
† Wilder, Kenneth W. ..... Minneapolis
† Wilder, Robert L. ..... Minneapolis
† Wilder, Russell M. ..... Rochester
† Wilder, Russell M., Jr. ..... Topeka, Kansas
Wilder, Walter L. ..... Minneapolis
Wilken, Paul A. ..... Minneapolis
† Wilkowske, Rudolph J. ..... Owatonna
Will, Charles B. ..... International Falls
Will, W. W. ..... Bertha
† Williams, Arthur B. ..... St. Paul
Williams, Bruce F. ..... Duluth
† Williams, Charles A. ..... Seattle, Washington
Williams, Clayton K. ..... St. Paul
‡ Williams, Francis R. ..... Duluth
Williams, George E. ..... St. Paul
Williams, Henry L., Jr. ..... Rochester
† Williams, Hugh O. ..... Lake Crystal
Williams, John A. ..... St. Paul
* Williams, Leon A. ..... Lester Prairie
Williams, Mervyn M. ..... Ah-gwah-ching
Williams, Marland R. ..... Cannon Falls
Williams, Paul A. ..... Minneapolis
Williams, Richard A. ..... St. Paul Park
Williams, Richard E. ..... Robbinsdale
† Williams, Robert ..... Unknown
Williamson, Harold A. ..... Fairmont
Wilmot, Cecil A. ..... Litchfield
Wilmot, Harold E. ..... Litchfield
† Wilson, Clyde E. ..... Blue Earth
Wilson, J. Allen ..... St. Paul
Wilson, James V. ..... St. Paul
Wilson, Louis J. ..... Winona
Wilson, Paul F. ..... Rochester
Wilson, Robert B. ..... Rochester
Wilson, Robert E. ..... Minneapolis
Wilson, Rolland H. ..... Winona
Wilson, Viktor O. ..... Rochester
Wilson, Warren E. ..... Northfield
Winchell, Paul ..... Minneapolis
Winge, H. C. ..... Wheaton
* Wingquist, Carl G. ..... Ironton
Winkelmann, Richard K. ..... Rochester
† Winnick, Jos. B. ..... St. Paul
† Winter, John A. ..... Duluth
‡ Winter, Malcolm D., Jr. ..... Ellsworth, South Dakota
Winther, Nora M. ..... Minneapolis
Wipperman, Frederic F. ..... Minneapolis
Wise, James K. ..... Rochester
Wisness, Osmund A. ..... Minneapolis
† Witham, Carl A. ..... Minneapolis
† Witten, David M. ..... Rochester
Witter, Robert L. ..... Wadena
Witthaus, Melvin E. ..... St. Paul
† Wittich, Frederick W. ..... Minneapolis
Wittrock, Louis H. ..... Watkins
Wohlrabe, Arthur A. ..... Minneapolis
Wohlrabe, A. Cabot ..... Minneapolis
Wohlrabe, Clarence F. ..... North Mankato
Wohlrabe, Donald E. ..... Springfield
Wohlrabe, Edwin J. ..... Springfield
Wohlrabe, John C. ..... North Mankato
Wolf, Alfred H. ..... Minneapolis
Wolff, John M. ..... Duluth
Wolkoff, Hyman J. ..... St. Paul
Wollaeger, Eric E. ..... Rochester
Wolter, Frederick H. ..... Minneapolis
† Woltman, Henry W. ..... Rochester
Wood, Lloyd T. ..... Rochester
Woodington, George F. ..... Rochester
Woodruff, Whitney ..... Virginia
Woolner, Lewis B. ..... Rochester
Word, Harlan L. ..... St. Paul
† Worlton, James T., Jr. ..... Rochester
Workman, Warner G. ..... Tracy
† Woyda, William C. ..... Minneapolis
Wright, Robert R. ..... Austin
Wright, Thomas D. ..... Minneapolis
Wright, Wale S. ..... Minneapolis
Wright, William S. ..... Edina
† Wry, Paul E. ..... Rochester
Yaeger, Wilbert W. ..... Marshall
Ylvisaker, Ragnvald S. ..... Minneapolis
† Yoerg, Otto W. ..... Minneapolis
Yoss, Robert E. ..... Rochester
Young, Henry H. ..... Rochester
Young, Thos. O. ..... Duluth
Younger, Lewis I. ..... Winona
Youngren, Everett R. ..... St. Paul
Yue, Wen Y. ..... Oak Terrace
Zachman, Albert H. ..... Melrose
Zachman, Leo L. ..... St. Paul
Zagaria, James F. ..... St. Paul
Zahrendt, O. Lewis ..... Minneapolis
Zarling, V. Richard ..... Minneapolis
Zaworski, Leo A. ..... Minneapolis
‡ Zeigler, Charles M. ..... Pine River
Zeleny, Joseph H. ..... Rochester
‡ Zeller, Nicholas H. ..... Unknown
Zemke, Erhart E. ..... Fairmont
Zemmers, Roberts ..... Duluth
Zempel, Alan R. ..... Starbuck
Zierold, Arthur A. ..... Minneapolis
Zimmer, Roy W., Jr. ..... Rochester
Zimmermann, Bernard M. ..... St. Paul
† Zimmermann, Harry B. ..... St. Paul
Zinn, Charles W. ..... Elk River
Zinter, Ferdinand A. ..... Minneapolis
† Ziskin, Thos. ..... Minneapolis

Committee Action

COMMITTEE ON HOSPITALS AND MEDICAL EDUCATION

Hospital Construction
College of Medical Sciences
Medical Education
Nursing
Medical Technology

Hospital Construction in Minnesota

The Committee noted with pleasure the report of the Minnesota Department of Health indicating that during 1958 nineteen new hospitals or hospital units in the state were completed while an additional thirty projects were under construction. Nineteen of the programs were accomplished with the assistance of the Hill-Burton program, the remainder without such assistance. Altogether, the new construction already completed during 1958 will provide 1022 general beds, while projects under construction will ultimately provide an additional 1846.

Colleges of Medical Sciences

The year was marked by the retirement on June 30, 1958, of Dr. H. S. Diehl, who had served the University of Minnesota for more than forty years and for twenty-three years had been Dean of the Medical Sciences. In the spring of 1957, officials of the American Cancer Society offered Dr. Diehl the newly-created post of senior vice president for Research and Medical Affairs and deputy executive vice president. Faced with compulsory retirement from the University in June 1960, and bearing in mind that the proposed Cancer Society post would permit him to contribute significantly to American medicine for several years beyond this time, Doctor Diehl reluctantly decided to advance the date of his retirement and to accept the new position, a decision made only after much serious reflection and with due consideration of the many factors concerned. He began his new duties on November 1, 1957, but continued to serve as Dean of the Medical Sciences on the basis of a part-time leave of absence during the remainder of the academic year.

For nearly a quarter of a century, Dr. Diehl has presided over the fortunes of the College of Medical Sciences with consummate skill during a period of remarkable development and expansion, a period of momentous change in medicine, a period in which Minnesota took its place among the nation's finest medical schools. A wise administrator with a thorough knowledge of all aspects of medical education, Dr. Diehl is widely recognized in this country and abroad as one of the nation's outstanding leaders in this field. His retirement leaves a void which will be most difficult to fill, and he will be sorely missed by his friends and colleagues for both personal and professional reasons.

Dr. Robert B. Howard, who had served as Director of the Department of Continuation Medical Education since January 1952, was named Associate Dean of the Medical Sciences, effective October 1, 1957, and he thus served as the principal full-time administrative officer of the College during the period of Dr. Diehl's partial leave of absence. On June 13, 1958, President Morrill, following consultation with an advisory committee that he had appointed earlier, recommended to the Board of Regents the appointment of Doctor Howard as Dean of the Medical Sciences, effective July 1, 1958. This recommendation was approved by the Regents.

Medical Students

In June 1958, 113 students were graduated and in June 1959, 116 students are being awarded the Doctor of Medicine degree by the University of Minnesota. The number of students admitted to the Medical School in September 1958, was 139, while 150 were admitted in September, 1959.

Graduate Medical Training

The State of Minnesota continues to occupy a leading place nationally and internationally in graduate training in medicine, almost all of which is carried out under the Graduate School of the University. During the 1958-1959 academic year, more than 1000 graduate students were enrolled in the basic medical sciences and the clinical specialties of medicine, including those enrolled in the Mayo Foundation program in Rochester and those enrolled in the Medical School program in Minneapolis which utilizes for graduate training in the clinical fields, not only the University of Minnesota Hospitals, but also Minneapolis General Hospital, Minneapolis Veterans Administration Hospital, Ancker Hospital in St. Paul, the Gillette State Hospital, and several private hospitals in the Twin Cities.

Continuation Medical Education

The Department of Continuation Medical Education, which presents each year a series of continuation courses for physicians, continues to provide the practicing physicians of Minnesota with an opportunity to review significant fundamental material and to learn of important advances in medical practice. The unique facilities

(Continued on Page 800)

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SEARLE

(Continued from Page 798)

of the Center for Continuation Study provide an atmosphere especially conducive to learning.

During the 1957-58 academic year, 1,414 physicians attended twenty-two courses at the Center for Continuation Study. All but eight of these courses were intended primarily for physicians engaged in general practice. During the 1958-59 academic year, twenty-two courses, fifteen of them primarily for general physicians, have been or will be presented. Preliminary figures indicate that attendance during the current academic year will surpass that of last year. Since the fall of 1957, in addition to courses presented at the Center, Regional Seminars for physicians have been presented in Alexandria, Marshall, Fairmont, Detroit Lakes, Olivia-Redwood Falls, and Hibbing by the University in conjunction with the Minnesota State Medical Association and local medical groups.

The Department of Continuation Medical Education also is responsible for the planning and presentation of continuation courses for nurses, medical technologists, and dietitians. These programs continue to be well received.

Nursing

The provision of adequate nursing service remains a difficult problem in certain areas of the state, particularly those in which new hospitals have been constructed or existing hospitals expanded. Minnesota, however, is distinctly above the national average in the number of nurses per 100,000 population. The latest available figures indicate that 11,586 professional nurses were actively engaged in nursing in Minnesota during 1957. The Minnesota Board of Nursing issued R. N. licenses to 1658 nurses during 1958.

Eight of Minnesota's twenty-six schools of nursing have four-year degree programs, but one of these is no longer admitting students and will close in 1962. Five diploma programs will close within the next two years, but two new diploma programs opened in 1958. On January 1, 1959, total enrollment in diploma and degree programs amounted to 3597.

Practical nursing training is carried chiefly by vocational education departments of school systems in conjunction with local hospitals. On January 1, 1959, Minnesota had twenty schools of practical nursing with a total enrollment of 535. The Board of Nursing issued 743 L.P.N. licenses during 1958. A new development in Minnesota is the preparation of non-professional nursing personnel for the care of psychiatric patients.

Education for advanced professional nursing—administrative, teaching, supervisory, and public health nursing—is centered in the University of

(Continued on Page 802)



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Composition: Each light-pink, scored tablet contains 1 mg. 2-diethylaminoethyl benzilate hydrochloride (benactyzine HCl) and 400 mg. meprobamate.

References:
1. Alexander, L.: J.A.M.A. 166:1019, March 1, 1958.
2. Current personal communications; in the files of Wallace Laboratories.
3. Pennington, V.M.: Am. J. Psychiat. 115:250, Sept. 1958.

for depression

▲Deprol▲†

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(Continued from Page 800)

Minnesota which trains more teachers of nursing than any other institution in the country.

Rural community nursing is a part of the basic educational program of many schools of nursing in Minnesota. Experience for students is provided through affiliation with community hospitals outside the metropolitan areas of the state. Schools of nursing in Minneapolis, St. Paul, and Duluth assign students to community hospitals in Bemidji, Benson, Fairmont, Grand Rapids, Hibbing, Litchfield, Pipestone, Sauk Centre, Sleepy Eye, Stillwater, Thief River Falls and Worthington. The University of Minnesota provides the direction and co-ordination of this program.

Special educational nursing services in the state include extension classes, workshops, and institutes. Since 1951, the Minnesota State Nurse Scholarship Act has provided more than 1,851 scholarships.

Medical Technology

Although in the past few years the number of students completing requirements for the four-year degree program in Medical Technology has been below normal, the present indication of slight increases in the number of students in this program is encouraging. The present senior class has twenty-five students and the anticipated figure for next year is thirty.

The increasing need in the state for the services of the professional graduate Medical Technologist serves to emphasize the present critical shortage of laboratory personnel. Continued and vigorous efforts toward recruitment of students are urgently recommended.

Laboratory Aide Program

The Laboratory Aide program continues to expand. Currently, twenty-three hospitals, eleven of them outside the Twin Cities, provide clinical training for students. Since its inception in 1953, eighty-seven students have been graduated from this course, and forty-two will be graduated during 1959.

General awareness of the Laboratory Aide Program appears to be increasing, and enrollment in it may be expected to rise. Future expansion of the program should be contemplated if necessary financial support is available.

Acknowledgment

I am deeply indebted to Dr. Helen L. Knudsen, Director, Division of Hospital Service, State of Minnesota Department of Health; Miss Ruth Hovde, Associate Director, Medical Technology, University of Minnesota and Miss Leonora Collatz, Executive Secretary, Minnesota Board of Nursing, for the information they provided for this report.

ROBERT B. HOWARD, *Chairman*



he deserves

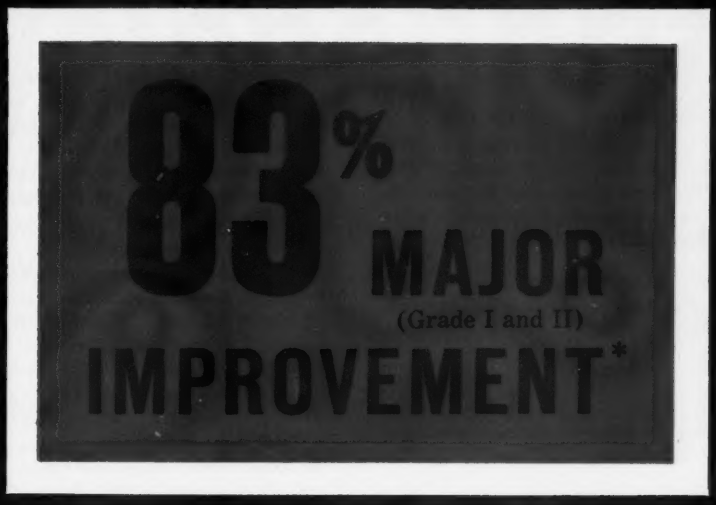
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Meetings and Announcements

STATE

The Minnesota Chapter of the American College of Chest Physicians will hold its annual meeting at Roberts Pine Beach Lodge on Gull Lake near Brainerd, Minnesota, July 11-12, 1959. Reservations may be made directly to the lodge, or to Coleman J. Connolly, M.D., 471 Lowry Medical Arts Building, St. Paul 2, Minnesota.

Minnesota Surgical Society, Spring Meeting, Duluth, Minnesota, July 17; Fall Meeting, Minneapolis, Minnesota, October 30, 1959.

NATIONAL

The American College of Surgeons sectional meetings:

September

Annual Clinical Congress, Atlantic City, New Jersey, September 28-October 2. Dr. Michael L. Mason, Secretary, 40 East Erie Street, Chicago 11, Illinois.

American Heart Association, Annual Meeting and Scientific Sessions, October 23-27, 1959, Philadelphia. Scientific Sessions scheduled for October 23-25 at Trade and Convention Center. Annual Meeting of the National Assembly, Hotel Bellevue Stratford, October 26-27. Information available from Minnesota Heart Association, 1821 University Avenue, St. Paul 4, Minnesota.

The annual course in Postgraduate Gastroenterology, sponsored by The American College of Gastroenterology, will be given at The Biltmore in Los Angeles, California, September 24, 25 and 26, 1959. For further information and enrollment, write to the American College of Gastroenterology, 33 West 60th Street, New York 23, New York.

The Thirty-sixth Annual Conference of the American Physical Therapy Association, June 21-26, 1959, Hotel Leamington, Minneapolis, Minnesota.

National Society for Crippled Children and Adults, Annual Convention, November 29-December 2, 1959, Palmer House, Chicago. For further information, write Miss Catharine Bauer, Director of Information, 2023 West Ogden Avenue, Chicago 12, Illinois.

Oregon Cancer Conference, sponsored jointly by the Oregon State Medical Society, the Oregon Division of the American Cancer Society, the University of Oregon Medical School and the Oregon Academy of General Practice, July 16-17, 1959, Portland, Oregon.

Pan-Pacific Surgical Association, Eighth Congress, Honolulu, Hawaii, September 28 through October 5 in 1960. Further information and brochures may be obtained by writing to Dr. F. J. Pinkerton, Director General of the Pan-Pacific Surgical Association, Suite 230, Alexander Young Building, Honolulu 13, Hawaii.

A Postgraduate Course in Occupational Skin Problems will be given at the Institute of Industrial Health to be held at the University of Cincinnati, Cincinnati, Ohio, October 26-30, 1959. For further information, write to the Secretary, Institute of Industrial Health, The Kettering Laboratory, Eden and Bethesda Avenues, Cincinnati 19, Ohio.

Second Annual Postgraduate Refresher Course, University of Southern California School of Medicine, July 29-August 15, 1959, Honolulu, Hawaii, and on board *The SS Lurline*. For information, write, Director, Postgraduate Division, U.S.C. School of Medicine, 2025 Zonal Avenue, Los Angeles 33, California.

Twelfth Annual Meeting of the American Association of Blood Banks, Edgewater Beach Hotel, Chicago, Illinois, November 4-7, 1959. For further information write, Office of the Secretary, American Association of Blood Banks, 30 North Michigan Avenue, Chicago 2, Illinois.

Twelfth Annual Conference on Electrical Techniques in Medicine and Biology, Sheraton Hotel, Philadelphia, Pennsylvania, November 10-12, 1959. For further information, write Dr. Herman P. Schwan, Moore School of Electrical Engineering, University of Pennsylvania, Philadelphia, Pennsylvania.

Eighty-seventh Annual Meeting of the American Public Health Association, Atlantic City Convention Hall, Atlantic City, New Jersey, October 19-23, 1959.

Seventh Annual National Medical Civil Defense Conference, June 6, 1959, Atlantic City, New Jersey, American Room, Traymore Hotel. Sponsored by Council on National Defense, American Medical Association.

INTERNATIONAL

Eighth Bahamas Medical Conference, British Colonial Hotel, Nassau, Bahamas, November 27 until December 17, 1959.

Second Bahamas Surgical Conference, British Colonial Hotel, Nassau, Bahamas, December 28, 1959 until January 16, 1960.

International College of Surgeons, Twelfth Biennial International Congress, Rome, Italy, May 15-18, 1960.

Fourth International Goiter Conference, July 5-9, 1960, London, England, under the auspices of the London Thyroid Club and the American Goiter Association. Application blanks are available from John C. McClintock, M.D., 149½ Washington Avenue, Albany 10, New York, U.S.A.

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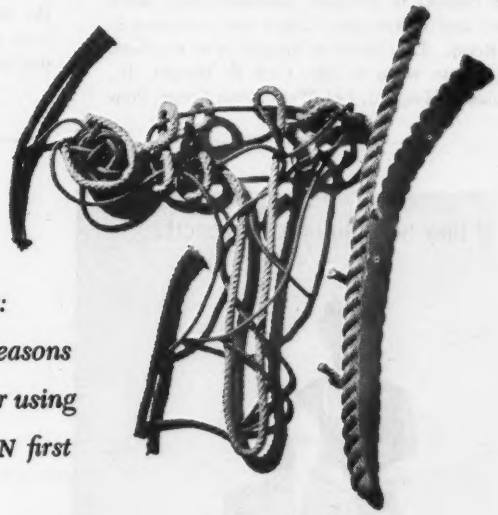
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References: 1. Smith, I. M., and Lenyo, L.: Am. Practitioner 9:78, 1958. 2. Jawetz, E., et al.: A.M.A. Arch. Int. M. 100:549, 1957.

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INTERNATIONAL

(Continued from Page 804)

North American Federation, Twenty-Fourth Annual Congress, International College of Surgeons, Chicago, September 13-17. For information, write The Secretariat, International College of Surgeons, 1516 Lake Shore Drive, Chicago 10.

The First International Medical Conference on Mental Retardation, July 27-31, 1959, The Eastland Hotel, Portland, Maine.

Pan American Medical Association Congress, Mexico City, Mexico, May 2-11, 1960. For further information, write Dr. Joseph J. Eller, Director General, 745 Fifth Avenue, New York, New York.

COURSE IN CONDUCT OF LABOR AND DELIVERY

The Woman's Hospital Division of St. Luke's Hospital in New York City offers a one-week course in "The Conduct of Labor and Delivery." This is for general practitioners and thirty hours Category I credit is allowed by the American Academy of General Practice.

The course consists of lectures, demonstrations, work in the Prenatal and Postpartum Clinics and assistance in the Delivery Room. Enrollment is limited as to numbers. If interested, please write to Mr. Carl P. Wright, Jr., Director, Woman's Hospital, 141 West 109th Street, New York City, for prospectus and details. The time of the course is October 8 through October 14, 1959. Enrollment will close on September 15, 1959.

ARTHRITIS AND RHEUMATISM FOUNDATION AWARDS

The Arthritis and Rheumatism Foundation offers predoctoral, postdoctoral and senior investigatorship awards in the fundamental sciences related to arthritis for work beginning July 1, 1960. Deadline for applications is October 31, 1959.

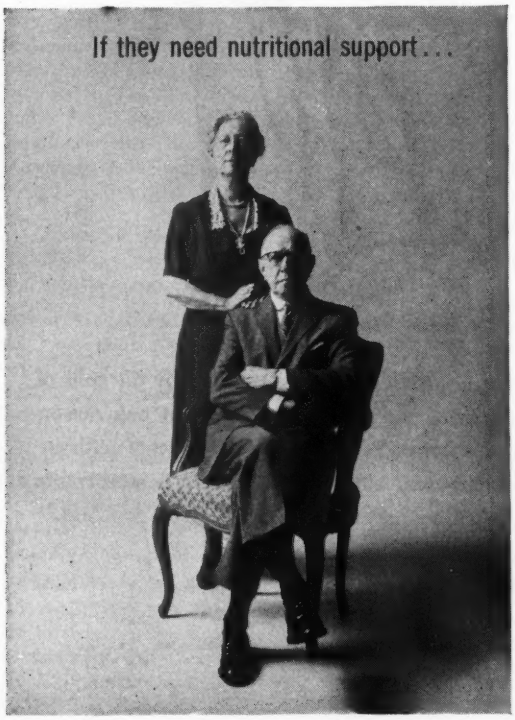
These awards are intended as fellowships to advance the training of young men and women of promise for an investigative or teaching career. They are not in the nature of a grant-in-aid in support of a research project.

The program provides for three awards:

Predoctoral Fellowships are limited to students who hold a bachelor's degree. Each applicant studying for an advanced degree must be acceptable to the individual under whom the work will be done. These Fellowships are tenable for one year, with prospect of renewal. Stipends range from $1500 to $3000 per year, depending upon the family responsibilities of the Fellow.

Postdoctoral Fellowships are limited to applicants with the degree of Doctor of Medicine, Doctor of Philosophy —or their equivalent. These Fellowships are tenable for one year, with prospect of renewal. Stipends range from

(Continued on Page 808)



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Dosage: 10 mg. b.i.d. (morning and evening).

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Brooklyn 6, New York

References: 1. Finkelstein, M., et al.: J. Pharmacol. & Exper. Therap. 125:330 (April) 1959. 2. McHardy, G., et al.: Postgrad. Med., in press. 3. Winkelstein, A.: Amer. J. Gastroenterol., in press. 4. Finkelstein, M., et al.: Presented at Fall Meeting, Amer. Soc. Pharmacol. & Exper. Therap., 1958. 5. Leming, B.: Clin. Med. 6:423 (March) 1959.

*Trademark

ARTHRITIS AND RHEUMATISM FOUNDATION AWARDS

(Continued from Page 806)

$4000 to $6000 per year, depending upon the family responsibilities of the Fellow.

Senior Investigator Awards are made to candidates holding or eligible for a "faculty rank" such as Instructor or Assistant Professor (or equivalent) and who are sponsored by their institution. Stipends are from $6000 to $10,000 per year and are tenable for five years.

A sum of $500 will be paid to cover the laboratory expenses of each postdoctoral fellow and senior investigator. An equal sum will be paid to either cover the tuition expense or laboratory expenses of each predoctoral fellow.

For further information and application forms, address the Medical Director, Arthritis and Rheumatism Foundation, 10 Columbus Circle, New York 19, New York.

AMERICAN UROLOGICAL ASSOCIATION AWARD

Urology Award—The American Urological Association offers an annual award of $1,000 (first prize $500, second prize $300 and third prize $200) for essays on the result of some clinical or laboratory research in urology. Competition is limited to urologists who have been graduated not more than ten years, and to hospital interns and residents doing research work in urology.

The first prize essay will appear on the program of the forthcoming meeting of the American Urological Association, to be held at the Palmer House, Chicago, Illinois, May 16-19, 1960.

For full particulars, write the Executive Secretary, William P. Didusch, 1120 North Charles Street, Baltimore, Maryland. Essays must be in his hands before December 1, 1959.

AWARDS FOR OBSTETRIC PAPERS

The Junior Fellow Division of District VI of The American College of Obstetricians and Gynecologists is offering one $100 First Award and one $50 Second Award for the best original investigative or clinical work in the field of gynecology, and a $100 First Award and a $50 Second Award for the best original investigative or clinical work in this field of obstetrics. Papers may be submitted by any resident in an accredited hospital within the confines of District VI, i.e., Illinois, Minnesota, Iowa, Nebraska, North Dakota, South Dakota, Wisconsin, and Manitoba and Saskatchewan, Canada.

For consideration for a prize this year, the papers must be received before August 1, 1959. They must be submitted in triplicate, without author identification on any copy. A covering identifying letter should be addressed to: Roger D. Kempers, M.D., Secretary-Treasurer, District VI Junior Fellow Division, Mayo Foundation, Rochester, Minnesota.



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Iron (as Fumarate)	10 mg.
Iodine (as KI)	0.1 mg.
Calcium (as $CaHPO_4$)	157 mg.
Phosphorus (as $CaHPO_4$)	122 mg.
Boron (as $Na_2B_4O_7.10H_2O$)	0.1 mg.
Copper (as CuO)	1 mg.
Fluorine (as CaF_2)	0.1 mg.
Manganese (as MnO_2)	1 mg.
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Woman's Auxiliary

HENNEPIN COUNTY AUXILIARY ELECTS OFFICERS

Mrs. Frederick G. Gunlaugson was elected president of the Woman's Auxiliary to the Hennepin County Medical Society at its annual meeting held recently at the Wayzata Country Club.

Also elected were: Mrs. Robert O. Quello, president-elect; Mrs. Sam Leonard, first vice president; Mrs. John P. Wendland, treasurer; Mrs. Henry W. Quist, Jr., assistant treasurer; Mrs. Theodore S. Smith, recording secretary; Mrs. Robert W. Goltz, corresponding secretary; Mrs. James E. Blake, auditor; and Mrs. Conrad J. Holmberg, custodian.

RAMSEY COUNTY PROJECTS HAVE YOUTH EMPHASIS

Salute to Youth Day.—The Ramsey County Auxiliary participated in the "Salute to Youth Day" recently, sponsored by the Inter Club Council of St. Paul. Outstanding and deserving students of the high schools were chosen to be honored.

Robert Kelsey, son of Dr. and Mrs. C. M. Kelsey, was the student selected by the Ramsey County Medical Auxiliary to be honored. Robert has been a leader in the Boy Scouts for many years. He is an Eagle Scout and, in 1956, attended a Boy Scout Rally in England.

In the past year, as a senior, Robert did a study on Salk vaccine for the Science Fair. Robert will attend Carleton College and plans to study medicine.

The Ramsey County Medical Auxiliary has been very happy to participate in both of these programs benefiting the youth of our country.

"Careers—See it In Action" Day.—The Woman's Auxiliary to the Ramsey County Medical Society co-sponsored with the Altrusa Club of St. Paul, a "Careers—See It In Action" day at the University of Minnesota. Senior students of the St. Paul high schools were transported to the University where they visited the hospitals and other medical facilities. The students had the opportunity to learn, at first hand, more about medical education and the allied fields which are offered at the University of Minnesota.

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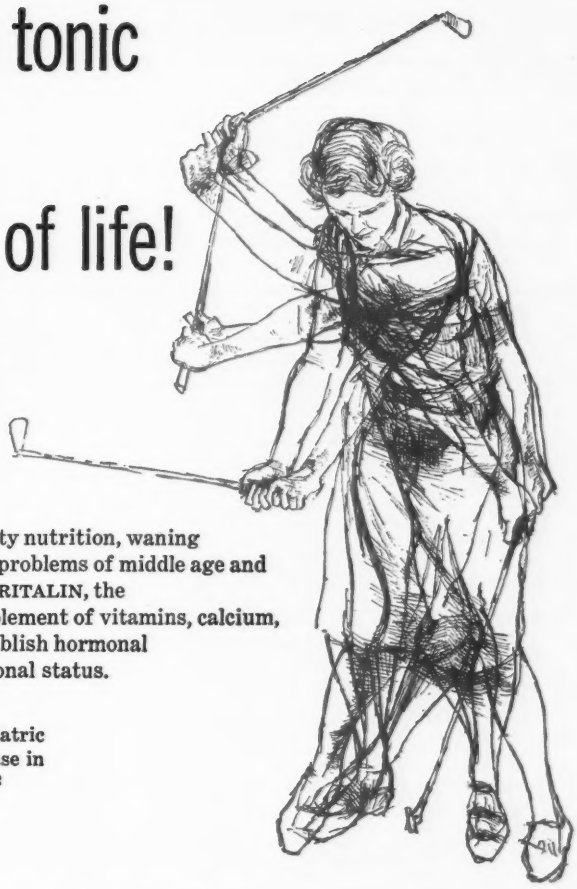


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Each Ritonic Capsule contains:

Ritalin® hydrochloride	5 mg.
methyltestosterone	1.25 mg.
ethinyl estradiol	5 micrograms
thiamin (vitamin B_1)	5 mg.
riboflavin (vitamin B_2)	1 mg.
pyridoxin (vitamin B_6)	2 mg.
vitamin B_{12} activity	2 micrograms
nicotinamide	25 mg.
dicalcium phosphate	250 mg.

Dosage: One Ritonic Capsule in mid-morning and one in mid-afternoon.
Supplied: Ritonic CAPSULES; bottles of 100.
References: 1. Natenshon, A. L.: J. Am. Geriatrics Soc. *6*:534 (July) 1958.
2. Bachrach, S.: To be published.
RITALIN® hydrochloride (methylphenidate hydrochloride CIBA)

CIBA SUMMIT, N. J.

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(Continued from Page 810)

RENVILLE-REDWOOD OBSERVES TWENTY-FIFTH ANNIVERSARY

The Renville-Redwood County Medical Auxiliary celebrated its Twenty-Fifth Anniversary on April 30 at Olivia, Minnesota. Members of the surrounding county auxiliaries were their guests at a bridge luncheon. A highlight of entertainment was a style show consisting of clothes from the era of the organization's beginning and modeled by the auxiliary's own members.

Charter members who were present and honored with corsages were Mrs. W. Dummer, Fairfax; Mrs. R. Billings, Franklin; Mrs. G. Mesker and Mrs. J. A. Cosgriff, Sr., from Olivia. Those not present but honored with flowers were Mrs. John Dordal, Sacred Heart, and Mrs. Arthur Fawcett, of Renville.

The doctors of the Renville-Redwood Medical Society added to the festivity by presenting their wives with red roses.

Mrs. James Cosgriff, Sr., and Mrs. Harvey Knoche were in charge of arrangements.

WASHINGTON COUNTY MEETS

Members of the Washington County Medical Auxiliary, at their April meeting, were urged to bring contributions of any kind and medical magazines, to be sent to hospitals and clinics in the United States and foreign countries. The Auxiliary met at the home of Mrs. George Mitchell for a 1:30 p.m. luncheon.

Communications

This Section is for you to voice your convictions, comments, and queries on all subjects political, economic, historic, humorous, scientific or otherwise, to many physicians. Writings not sufficiently formal and too brief for an editorial or a scientific manuscript are requested. Clinical and research observations, no matter how brief, similar to those in *The Lancet* (London), are particularly encouraged.

"CAUTION"

According to the *New York Daily Mirror:* "The government today warned wearers of contact lenses to beware of current stocks of a cleaning fluid called Barnes-Hind Wetting Solution." It was stated that some of the fluid is contaminated and could cause blindness in persons with injured or infected eyes. Supplies have been recalled by the manufacturer. Replacement supplies will be available soon. Druggists have been advised to discontinue selling current stocks of this product and return unsold stocks to Barnes-Hinds Ophthalmic Products, Inc., 895 Kifer Road, Sunnyvale, California, for replacement.

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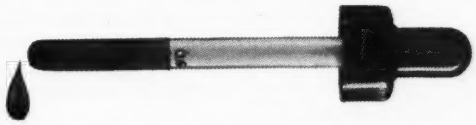
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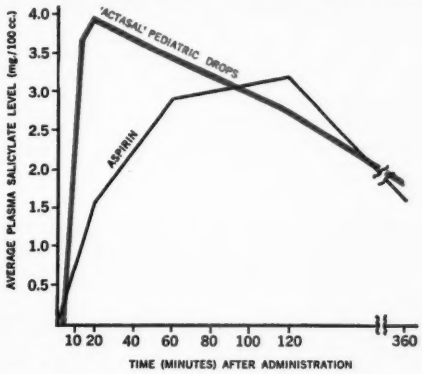
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Clinically proved – In thousands of cases by more than 180 investigators[4]

• more effective • better tolerated

A new and unique salicylate molecule in palatable solution.

DOSAGE: Each dropperful (0.6 ml.) contains 105 mg. Choline Salicylate, equivalent to approximately 1¼ grains aspirin.

Children 6-12 years: 2 to 4 dropperfuls every 3 to 4 hours, or as required. Children 3-6 years: 1 to 2 dropperfuls every 3 to 4 hours, or as required. Children under 3 years: 1 dropperful every 3 to 4 hours, or as required.

SUPPLY: 60 cc. bottle packaged with cellophane-wrapped calibrated dropper.

CITED REFERENCES: 1. Smith, P. K.: Personal Communication. 2. Wolf, J., Aboody, R.: Federation Proc. 18:605, 1959. 3. Broh-Kahn, R. H.: Federation Proc. 18:17, 1959. 4. Complete data available on request to the Medical Director.

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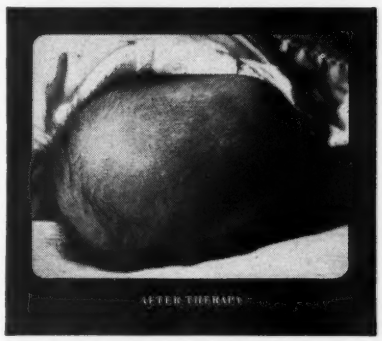
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Bialkin, G.: Scientific Exhibit, American Academy of General Practice, San Francisco, April 6-9, 1959.

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Bialkin, G.: A New Anti-Seborrheic Agent in Pediatric Practice. Arch. of Ped. (to be published).

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The Physician's Diary

Dr. Alan M. McKaig, resident physician with the Red Lake Falls Clinic since August, 1950, announced recently that he would be leaving that city for the practice of medicine at Chenango Bridge, New York. Dr. McKaig will join a clinic there and specialize in obstetrics.

* * *

Open House was recently held at the new $400,000 Austin Clinic. It was opened March 2—forty years after four doctors first associated themselves in medical practice as the Austin Clinic. The original clinic staff, Dr. C. F. Lewis, Dr. C. C. Allen, Dr. E. C. Rebman, and Dr. W. B. Grise, are deceased. Dr. Grise participated in the planning, but died before the opening. The new building has office space for the fourteen doctors now on the staff. Present members of the staff include: **Drs. David P. Anderson** and **Harold J. Anderson,** surgeons; **Thomas M. Serry** and **John D. Hagan,** internal medicine; **L. G. Flanagan,** eye, ear, nose and throat; **E. C. Sargeant,** gynecology-obstetrics; **Wallace R. Anderson,** pediatrics; **F. H. Rosenthal, Robert R. Wright, H. P. Van Cleve, Inman A. Hesla** and **Harold E. Paulus,** general medicine; and **Stanley C. Peterson** and **John C. Todd,** consulting radiologists.

Members of the Mayo Clinic who have participated in recent meetings throughout the United States and Brazil include the following: **Dr. H. F. Polley** presented two papers at meetings in Rio de Janeiro, Brazil. He spoke on "The Development and Use of Steroids in Rheumatic Diseases," before the Academia Brasileira de Medicina, and read a paper, "Early Diagnosis and Current Treatment of Rheumatoid Spondylitis" at a meeting of the Sociedade Brasileira de Rheumatologia. He also participated in a round table discussion on "Dexamethasone and Steroids in General" at a meeting of the society. He presented a paper, "Current Use of Steroids in the Management of Rheumatoid Arthrutic" at a meeting of the Isthmian Medical Society in Panama City, Panama. **Dr. C. W. Mayo** presented a paper, "Survival in Carcinoma of the Rectum and Tectosigmoid: A Comparison of Operative Procedures," at a meeting of the Phi Beta Pi Alumni Association in Pittsburgh. **Dr. T. T. Myers** presented a paper at the Sectional Meeting of the American College of Surgeons in Vancouver, Washington. His paper was entitled "Is Major Surgery Necessary in the Treatment of Varicose Veins?" **Dr. H. L. Williams** attended meetings of the American Otological Society, the American Laryngological Society and the Triologi-

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cal Society in Hot Springs, Virginia. **Dr. J. T. Priestley** attended a meeting of the Board of Regents of the American College of Surgeons in St. Louis, and **Dr. H. M. Keith** assisted with examinations of the American Board of Pediatrics and also presented a paper, "Convulsions in Children," at a meeting of the local County Medical Society in Baton Rouge recently.

* * *

"Do We Need a County Board of Health?" was the topic discussed at a public meeting held recently in Alexander Ramsey High School, St. Paul. **Dr. Delmar Gillespie,** St. Paul, was one of the featured speakers. The meeting was arranged by the Ramsey County Council of the Leagues of Women Voters. Questions discussed included the following: Do Ramsey County suburbs now have adequate health services? Are the health services available in St. Paul sufficient? How would a County Board of Health be financed? What are alternative methods of increasing services?

* * *

Dr. Alfred Uihlein, neuro-surgeon at the Mayo Clinic, is currently in Europe where he is participating in a panel discussion sponsored by the Latin-Mediterranean Surgical Association. Then at Padua he will speak at the University on invitation of Dr. Piero Frugoni, who was a fellow in surgery in the Mayo Foundation from 1936-40 and is now clinical professor of neurologic surgery in the University of Padua. In Zurich, Dr. Uihlein is scheduled to speak before the medical students of the University. He will also deliver the MacArthur Postgraduate Lecture in Edinburgh, Scotland.

* * *

Dr. John J. Catlin, of Buffalo, was honored for his more than fifty years of service to that community and area in a special "King for a Day" program held at Buffalo recently. Dr. Catlin received the key to the city in the morning, and was guest of honor and principal subject at the program at school in the evening. Several speakers recalled the many events which highlighted his life's work in Buffalo. He was saluted for his activity in civic affairs as well as his career service with the American Legion and the Tuberculosis Association.

* * *

Dr. Frank H. Krusen, senior consultant in physical medicine of the Mayo Clinic and professor of physical medicine and rehabilitation, Mayo Foundation, will be the principal speaker at the dedication of the Gottsche Rehabilitation Center at Thermopolis, Wyoming, in the very near future.

* * *

Physicians of the Park Region Medical Association and lawyers of the Seventh Judicial District attended a legal-medical institute at Alexandria recently. The interprofessional group was addressed by Charles Murnane, St. Paul trial lawyer, and **Dr. Gordon Kamman,** St. Paul psychiatrist. Arrangements for the meeting were made

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by **Dr. P. M. Geiser,** secretary of the Park Region Medical Association and K. L. Wallace, President of the Seventh District Bar Association.

* * *

Dr. Wesley W. Spink, University of Minnesota Professor of Medicine, was elected First Vice President of the American College of Physicians at the organization's annual meeting in Chicago. Dr. Spink was also elected to the college's Board of Regents.

* * *

Dr. Raymond D. Pruitt, a consultant in internal medicine in the Mayo Clinic since 1943, associate director of the Mayo Foundation from 1953 to 1956, and professor of medicine in the Mayo Foundation, will leave July 1 to become Chairman of the Department of Medicine at the Baylor University College of Medicine in Houston, Texas. The appointment includes assignment as physician-in-chief to the Jefferson Davis Hospital and chief consultant in medicine to the Veterans Administration Hospital, Houston.

* * *

Dr. Walter A. Fansler, Emeritus Clinical Professor of Surgery, University of Minnesota, Minneapolis, Minnesota, will present a paper in a symposium on Cancer of the Rectum and Colon at a joint meeting of the Section of Proctology of the Royal Society of Medicine and the American Proctologic Society to be held in London, England, June 29-July 2, 1959.

* * *

The May meeting of the Minnesota Society of Neurology and Psychiatry was held at the Mayo Clinic, Rochester. Program participants and their presentations included the following: **Drs. R. W. Hollenhorst, J. R. Brown,** and **H. P. Wagener** presented "Neuro-ophthalmologic Aspects of Temporal Arteritis"; **Drs. W. M. Easson** and **R. M. Steinhilber** presented "Agression with Lethal Intent"; **Drs. J. G. Rushton, J. A. Gibilisco** and **N. P. Goldstein** presented "Atypical Facial Pain"; **Drs. R. J. White** and **C. S. McCarty** presented "Chronic Effects of Total Hemispherectomy and Hypothalamectomy in Monkeys and Dogs"; and **Dr. H. P. Rome** presented "Mushrooms, Psychosis and Folklore."

* * *

Dr. Rolf Andreassen, Minneapolis, was the guest speaker at the recent spring meeting of the Red River Valley Medical Society. Dr. Andreassen spoke on recent advances in arteriosclerosis control by special low fat diets.

* * *

Dr. Charles W. Mayo recently was honored with the highest award that can be conferred by a Scout Region, by the National Boy Scout Council. Presenting the honor was **Dr. Edward H. Rynearson,** Rochester, who received the honor several years ago. Presiding at a panel discussion was **Dr. Joseph F. Schaefer,** Owatonna.

* * *

Occupants of the new Luverne Medical Center will be **Dr. D. M. Odland,** Luverne, and **Dr. H. C. Halvorson,** Luverne. The new Medical Center was opened recently and Drs. Odland and Halvorson have set up practice there.

* * *

Dr. Cyrus O. Hansen, Minneapolis, has been appointed to participate on the new five-member Commission Board of the Glen Lake Sanatorium. Dr. Hansen is Chief Radiologist of Northwestern Hospital in Minnesota. His term will last until May 1, 1962.

* * *

It has been announced that **Dr. Cecil J. Watson,** Head of the Division of Medicine in the University of Minnesota Medical School, has been elected to membership in the National Academy of Sciences.

* * *

Dr. F. M. Jolin, who had been retired for about two years, recently opened an office in Remer, Minnesota.

* * *

Drs. R. T. Seashore, A. O. Swenson and **B. F. P. Williams,** attended the recent meeting of the American College of Obstetricians and Gynecologists in Atlantic City.

* * *

Dr. G. Keith Stillwell, a member of the Section of Physical Medicine and Rehabilitation of the Mayo Clinic, is the author of a chapter on "Clinical Electric Stimulation" in a volume, "Therapeutic Electricity and Ultraviolet Radiation," which is volume four of a set entitled the "Physical Medicine Library," edited by **Dr. Sidney Licht,** Assistant Clinical Professor of Medicine (physical medicine) in the Yale University School of Medicine, New Haven, Connecticut.

* * *

Dr. Colin S. McCarty, a member of the Section of Neurologic Surgery of the Mayo Clinic, and Associate

(Continued on Page 818)

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(Continued from Page 816)

Professor of Neurologic Surgery in the Mayo Foundation, was elected president of the Neuro-surgical Society of America at the meeting of the group at Hot Springs, Virginia, recently.

* * *

Principal speaker at a Tuberculosis Accreditation ceremony for Cass County held recently at Walker was **Dr. John B. O'Leary** of Brainerd. Dr. O'Leary's address was entitled "Tuberculosis Today."

* * *

Several Mayo Clinic staff members have given examinations in various specialties recently throughout the country. Dr. H. R. Butt participated in examinations of the American Board of Internal Medicine in Chicago; **Dr. O. T. Clagett** assisted with exams of the American Board of Thoracic Surgery in Los Angeles; and **Dr. R. T. Patrick** served as Associate Examiner for the American Board of Anesthesiology in Phoenix. Other Mayo Clinic news includes: **Dr. C. W. Mayo** was made an honorary member of the Medical Association of the Dominican Republic and spoke to the faculty and students of the Medical School in Trujillo; and **Dr. J. W. Kernohan** presided at a meeting of the American Board of Pathology in Boston.

* * *

Dr. John S. Chapman, Minneapolis, spoke recently on "Varieties of Tuberculosis in Children" at the North American Life and Casualty Company auditorium. Dr. Chapman presented the twenty-fourth annual John W. Bell Lecture before the Hennepin County Medical Society.

* * *

Certified as Chairman of the Minnesota Section of the American College of Obstetricians and Gynecologists at its seventh Annual Clinical Meeting held recently in Atlantic City was **Dr. John E. Faber** of the Mayo Clinic. Dr. Faber is the Head of a Section of Obstetrics at the Clinic, and an Instructor in Obstetrics and Gynecology in the Mayo Foundation.

* * *

Dr. A. B. Baker, Minneapolis, Head of the Department of Neurology, University of Minnesota, has been presented with a citation for "significant contributions to opportunities for normal living for people with epilepsy." The presentation was made at the eleventh annual meeting of the National Epilepsy League in Washington.

* * *

Dr. D. R. Nichols, Mayo Clinic, presented a talk at the International Symposium on the Prevention of Bacterial Resistance to Antibiotics, meeting in Perugia, Italy, recently.

* * *

Dr. M. A. Mochal, Thief River Falls, was the speaker at the Rotary Luncheon recently. His subject was the heart and the progress that is being made in dealing with its shortcomings.

* * *

Dr. J. Grafton Love, Head of the Section of Neurologic Surgery in the Mayo Clinic and Professor of

Neurologic Surgery in the Mayo Foundation, has been chosen President-elect of the Harvey Cushing Society at the Annual Meeting of the organization in New Orleans recently. **Dr. Hendrik J. Svien,** a member of the Section of Neurologic Surgery of the Mayo Clinic and Assistant Professor of Neurologic Surgery in the Mayo Foundation, was elected secretary of the society for a three-year term. Dr. Love will take office in 1961. Dr. Svien previously had been treasurer of the organization.

* * *

The community of Henderson honored **Dr. J. F. Traxler** on the forty-third anniversary of his service there, to show its appreciation of his work as a civic leader and physician.

* * *

Dr. Kenath Sponsel, orthopedic surgeon of Minneapolis, addressed the Southwestern Minnesota Medical Society at Worthington, May 11, 1959, on the subject, "Surgery of Hand Tendon Injuries." **Dr. Robert B. Howard,** dean of the College of Medical Sciences, University of Minnesota, also spoke to the group on "Challenges and Aims of the Medical School."

* * *

Dr. Reginald G. Bickford, head of the electroencephalographic laboratories of the Mayo Clinic, is the recipient of a travel award, conferred by the Institute of Radio Engineers, for his paper, "An Automatic System for the Recognition of a Spike-and-Wave Discharge," which he presented at the International Congress on Medical Electronics held in Paris, France, June 24 to 27, 1959. The award is one of eleven travel grants given on a national basis by the Institute of Radio Engineers.

Before proceeding to Paris, Dr. Bickford attended the annual meeting of the American Electroencephalographic Society at Atlantic City, New Jersey, where he presented a paper, "Glossokinetic Potentials Appearing in the Electroencephalogram," written with **Dr. Donald W. Klass,** an assistant in the Section of Physiology.

Dr. Bickford then attended a conference on "Data Processing in Medical Research" at Pougskeepsie, New York, sponsored by International Business Machines Corporation, at which he presented a paper on "Computational Aspects of the Electroencephalogram."

On June 16 Dr. Bickford left New York City for London, England, for a visit with his father and other relatives before attending the International Congress in Paris.

* * *

Dr. R. Drew Miller, consultant in medicine in the Mayo Clinic and assistant professor of medicine in the Mayo Foundation, Graduate School, University of Minnesota, has been appointed assistant director of the Mayo Foundation by the Board of Regents of the University of Minnesota. Dr. Miller will continue to devote approximately half his time to the practice of internal medicine in the Mayo Clinic.

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Public Health

SUFFOCATION HAZARDS OF PLASTIC MATERIALS

Members of the Minnesota State Medical Association are encouraged to co-operate in a program of public health education against suffocation due to a soft plastic bag of the type commonly used in commercial dry cleaning, food and household product packaging. According to Minnesota State Department of Health statistics, thirty-five suffocation deaths from plastic materials of this type have been reported by state health departments across the nation. In Minnesota, three deaths have been reported in this same period. A fourth death from plastic suffocation was recorded on Christmas Eve.

All of Minnesota's plastic deaths were in infants from two to four months of age. All of the deaths could have been prevented if the danger of this new plastic material could have been known by the parents. There should at least be a warning printed on the plastic informing parents of the danger to infants. Elsewhere in the nation, deaths have been reported in older youngsters who were accidentally suffocated while playing with the plastic over their heads. At least thirty-five such incidents have been reported in the United States since January 1, 1959,; the total for two years is more than fifty-five.

While the use of any plastic sheeting on cribs is potentially hazardous, the soft flimsy type now found on so many household products and on dry-cleaning is particularly so. Apparently, an electrostatic charge is easily generated by the mere friction of handling the soft, pliable material. Thus when the youngster moves around on the plastic in the crib or plays with it, it is quickly attracted to his face where it stubbornly molds itself over his nose and mouth cutting off the air. In spite of its thinness, the plastic does not tear readily when the child fights to get it off. Unless an adult comes to the child's rescue, death can ensue in a few minutes from suffocation.

According to Dr. A. B. Rosenfield, Director of the Division of Special Services of the Minnesota Department of Health, every year in Minnesota, approximately twenty-five infant deaths are reported due to "mechanical suffocation in crib or cradle." Autopsies have revealed, however, that many of these are actually the result of a respiratory infection believed to be caused by a virus. Often an apparently healthy baby is found dead under tossed bedclothing, and parents mistakenly conclude that the "accident" resulted from their negligence, whereas, death was probably caused by an infection and could not have been prevented.

In all infant deaths attributed to suffocation, it is essential that an autopsy be performed to determine whether death was due to suffocation or infection. If possible, the autopsy should be performed by a pathologist who is familiar with infant diseases.

Some precautions recommended to prevent accidental suffocations in children and infants are:

1. Do not use pillows in cribs—infants do not need them.
2. Do not use sheets of thin plastic material—such as bags from dry cleaning—as homemade covers for crib mattresses or sofa pillows.
3. Never allow children to play with plastic bags or coverings, and keep them out of their reach just as you would sharp knives or poisons.
4. Be sure that crib mattresses are firm and fill the crib completely—babies can smother in the space between the edge of the mattress and the crib ends.
5. Crib slats should be close together so that the baby cannot get his head between them and strangle.

A leaflet on helpful hints to parents on the correct use and misuse of plastic film is available in quantity, free of charge, from the Society of the Plastics Industry, Inc., 250 Park Avenue, New York 17, New York; or from the Minnesota State Medical Association, 496 Lowry Medical Arts Building, St. Paul 2, Minnesota.



Book Reviews

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

NOW OR NEVER. The Promise of the Middle Years. By Smiley Blanton, M.D., with Arthur Gordon. 275 pages. Price, $4.95. Englewood Cliffs, New Jersey: Prentice-Hall, 1959.

Written by a practicing psychiatrist for people between the ages of thirty-five and sixty, this book is designed for all the troubled, anxious people of middle age, who could be given self-knowledge and through the resulting insights be able to live full, happy lives.

Dr. Blanton is a Diplomate of the American Board of Psychiatry and Neurology. His work is centered in the American Foundation of Religion and Psychiatry, of which he is associate founder and director, and with the Religio-Psychiatric Clinic of the Marble Collegiate Church, of which he is director. By means of the case histories of those who have consulted him through these two avenues, particularly the former, he illustrates why many middle-aged people fail to live happy, satisfying, anxiety-free lives.

In the chapter, "Alcohol—Friend or Foe," he reiterates what he calls the theme of the book: The energy of youth enables the adolescent to build up defenses against hidden fears and anxieties, but as middle age approaches, his defenses weaken, and often the emotional tensions, which have been growing since childhood, will break through with results ranging from irritability or moodiness to a complete mental "breakdown." Not all middle-aged people require expert medical help. Some have developed an emotional maturity which enables them to tolerate anxiety. Many less fortunate ones, however, probably because of the way they were handled as children, find themselves beset with tensions and unconscious anxieties to the point where relief must be found.

Each chapter discusses an area where tensions are most likely to develop: marriage, children, work, money, the body, alcohol, sex, religion, aging parents, facing old age, and personality integration. Those who come to the Foundation for help gain understanding through psychotherapy of the causes of the difficulties and, hence, discover the solution to their problems.

Psychiatrists will surely find the book not only helpful but very interesting. Unfortunately, it contains no index and almost no bibliography.

YOUR MIND CAN MAKE YOU SICK OR WELL. Curt S. Wachtel, M.D. 244 pages. Price $4.95, cloth. Englewood, New Jersey: Prentice-Hall, Inc., 1959.

PATIENT CARE AND SPECIAL PROCEDURES IN X-RAY TECHNOLOGY. Carol Hocking Vennes, R.N., B.S., formerly Surgical Supervisor and Clinical Instructor, University of Minnesota Hospitals, Minneapolis, Minnesota, and John C. Watson, R.T., Director of Courses in X-Ray Technology, University of Minnesota Hospitals, Minneapolis, Minnesota. 203 pages. Illus. Price $5.75, cloth. St. Louis: C. V. Mosby Company, 1959.



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GENERALIST WANTED—Two general practitioners in Northern Minnesota desire association. Good office, hospital and school facilities. Salary open. Partnership later. Write E-674, care MINNESOTA MEDICINE.

MEDICAL AND SURGICAL CLINIC, located in moderate size Middle Western town, desires to increase staff in Internal Medicine Department. Candidates must be either Board certified or eligible for certification. Partnership in three years. Address E-677, care MINNESOTA MEDICINE.

LARGE MIDDLE WESTERN GROUP (specialists) desires association with orthopedic surgeon. Attractive salary arrangement and partnership in three years. Candidate must be either Board certified or eligible for certification. Address E-678, care MINNESOTA MEDICINE.

WANTED—GENERAL PRACTITIONER, about 40, interested in internal medicine. Well-established practice. Own building. Fully-equipped office. Association optional with or without obligation. Suburban practice using Minneapolis hospitals. Address E-679, care MINNESOTA MEDICINE.

YOUNG GENERAL PRACTITIONER wants associate. Early partnership. New ground floor office. X-ray, laboratory, EKG. R. G. Johnson, M.D., 4555 Bloomington Avenue, Minneapolis 7, Minnesota. Telephone PArkway 1-4222.

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Surgery of the Spleen

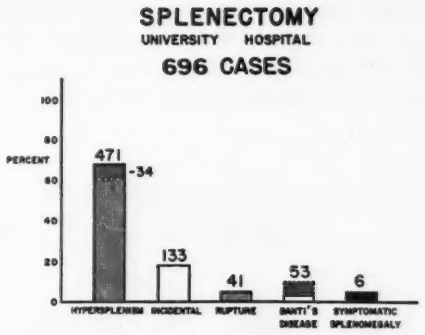


Fig. 1. Indications for splenectomy. Note that thirty-four cases are shown in both the hypersplenism and portal hypertension (Banti's disease) columns since there were two indications for splenectomy.

Splenectomy can be a life-saving procedure. 696 splenectomies were performed with a mortality of 1.9 per cent when the operation has been done for primary hypersplenism, but it increases to 13.6 per cent in those patients who have hypersplenism secondary to another disease. Splenectomy performed incidentally to other major upper abdominal surgery apparently does not increase the mortality in these cases. The use of ACTH and cortisone in hypersplenism has not removed nor reduced the need for splenectomy.

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A BETTER knowledge of the physiology of the spleen in relation to certain blood dyscrasias and portal hypertension has increased the number of splenectomies performed during recent years. The number of splenectomies varies according to the interests of hematologists, internists and surgeons in a given area. Surgeons, however, must be familiar with the various indications for splenectomy and the problems they present before, during, and after operation. This is a report of the indications for splenectomy and results of surgery in a university medical center.

During the twelve year period ending June 30, 1958, 696 splenectomies were performed at the University Hospital. Figure 1 shows the indications for splenectomy in the order of their frequency. Hypersplenism was the most common indication due to the interests of our hemotologists. Thirty-four patients are included in both groups of hypersplenism and Banti's disease. Thus, there were two indications for splenectomy in these patients. Removal of the spleen in combination with either the stomach, pancreas or colon for either benign or malignant disease or in the occasional case when the splenic capsule was torn during another operative procedure has been our

second most common indication for splenectomy. We have grouped these cases under "incidental splenectomy." Our experience with traumatic rupture of the spleen has been limited but this should not imply that rupture is an uncommon indication for splenectomy.

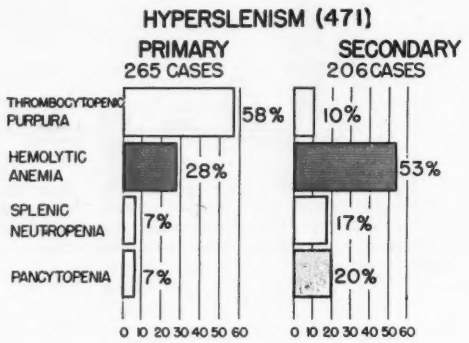


Fig. 2. Of the various cytopenics due to hypersplenism requiring splenectomy, hemolytic anemias are the most common (this includes acquired hemolytic anemia).

Hypersplenism

Figure 2 shows the incidence of the various cytopenias in 471 cases of hypersplenism. Idiopathic (primary) thrombocytopenic purpura has been the most common indication for splenectomy. Hemolytic anemias, both primary and secondary, apparently exceed thrombocytopenic purpura in frequency. In this series of cases those patients with idiopathic acquired hemolytic anemia have been grouped with the secondary hemolytic anemias, accounting for the increase in the latter.

Hypersplenism is a term used to describe an overactivity of the spleen which results in a decrease in one or more of the formed elements of the peripheral blood.[1] Whether the mechanism responsible for this hyperfunction is increased phagocytosis within the spleen or the production of a substance by the spleen which acts on the bone marrow or peripheral blood is a subject of continued investigation by hematologists.[2,3,4] Regardless of the basic mechanism involved, several clinical entities result, depending upon the deficient peripheral blood element. In addition, these diseases may be further divided into primary hypersplenism when of unknown cause and secondary hypersplenism when hyperfunction of the spleen occurs as a complication of another chronic systemic disease.

A decrease in blood platelets due to splenic overactivity unassociated with another disease process produces the disease known as idiopathic thrombocytopenic purpura. Primary or idiopathic hypersplenism involving the red cells leads to congenital hemolytic anemia (icterus). The decrease of white cells has been termed primary splenic neutropenia,[5] and when all three elements are involved, primary splenic panhematopenia.[6] The differential diagnosis in this group of diseases must be made by hematologists through a comparison of peripheral blood changes with bone marrow response.

The same cytopenias occur in secondary hypersplenism but the splenic overactivity is associated with another chronic disease. Figure 3 shows the chronic disease with which secondary hypersplenism developed as a complication. This secondary hypersplenism more often develops in patients with leukemia, a lymphoma, or some chronic infection such as tuberculosis. In addition, we have included as secondary hypersplenism forty-five patients with acquired hemolytic anemia and eight patients with Felty's syndrome although the primary systemic disease is not clearly defined.

The diagnosis of hypersplenism must be made by a competent hematologist if the results of surgery are to be good. Splenic enlargement is variable, being noted in nearly all patients with hemolytic anemia and all forms of secondary hypersplenism. It is so rare with idiopathic thrombocytopenic purpura that when noted it should suggest that the purpura is actually due to secondary hypersplenism. Bone marrow study is mandatory. A peripheral blood cytopenia is associated with an hyperplasia of the specific element(s) of the blood being destroyed. Special tests, such as the Coomb's hemagglutinin test and the determination of osmotic fragility, are important in determining whether an hemolytic anemia is of the acquired type. Lymph node biopsy, liver biopsy, or barium swallow may be helpful in determining other diseases when secondary hypersplenism is suspected.[7]

The results in the treatment of hypersplenism will depend on a correct diagnosis followed by close attention to pre and postoperative care and

a careful splenectomy. Whereas excellent results and a high cure rate follows splenectomy for primary hypersplenism, the immediate good hemotological results in secondary hypersplenism do not effect the course of the associated disease. Special factors in the preoperative preparation of patients with different forms of hypersplenism should be considered.

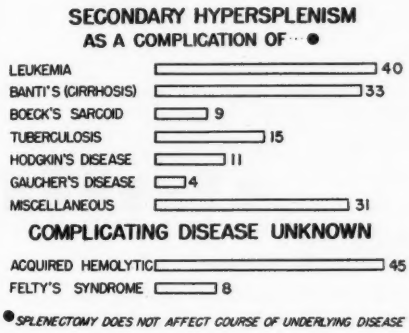


Fig. 3. The chronic diseases during the course of which secondary hypersplenism develops and the number of cases of each are listed. Splenectomy improves only the hematological state.

Preoperative Preparation

Thrombocytopenic Purpura.—The marked hemorrhagic tendency in thrombocytopenic purpura has suggested that these patients would benefit from fresh whole blood transfusions or from platelet transfusions. Nearly 50 per cent of our patients have had platelet counts below 10,000 and many have had spontaneous gastrointestinal or cerebral hemorrhage. Although blood platelet levels will be temporarily elevated with fresh blood, measurement of blood volume in a number of these patients has shown an average of over 1500 cc. volume deficits which suggest that volume replacement might be just as important as platelet replacement (Fig. 4). The frequently rapid rise of platelet levels following the use of ACTH or cortisone may therefore give a false sense of security when actually a blood volume deficit still persists.

Since these patients have a marked hemorrhagic tendency, naso-gastric intubation prior to surgery is not utilized. In addition, the anesthetist should be hesitant to use endotracheal intubation since oral-tracheal hemorrhage may produce marked respiratory embarrassment. This means that these patients should be at least 8 hours without food so that vomiting during the operative procedure

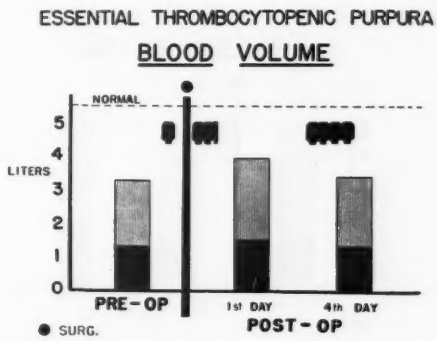


Fig. 4. The average blood volume values in eight cases of essential (primary) thrombocytopenic purpura are shown. Note the marked deficit in both red cell mass (black) and plasma volume (striped) and the average number of transfusions required (black "bottles," each equals 500 cc. whole blood).

or anesthetic recovery is not likely to occur. Although several years ago emergency splenectomy in those patients manifesting neurological symptoms was occasionally indicated, ACTH and cortisone have made possible the delay in most patients so that an elective splenectomy can be performed.

Hemolytic Anemia.—Splenectomy is often recommended in patients with hemolytic anemia despite an alarming anemia. Nearly half of our patients have had pre-operative red cell counts below 2.5 million and hemoglobin levels below 10.0 grams which are well below the usually accepted safe levels for elective major surgery. Many of these patients, however, have already had a hemolytic crisis and since preoperative blood transfusions usually increase hemolysis and may further precipitate another crisis, the hematologist may consider transfusion contraindicated. Although blood volume measurements have shown a marked deficit in red cell mass in these patients (Fig. 5) there is usually a compensatory increase in the plasma volume so that if adequate oxygen is given during anesthesia they will tolerate surgery well. These patients should therefore be ambulatory with an adequate vital capacity prior to elective

splenectomy. Ligation of the splenic artery as an initial step prior to surgery makes possible the giving of necessary transfusions during the operative procedure.

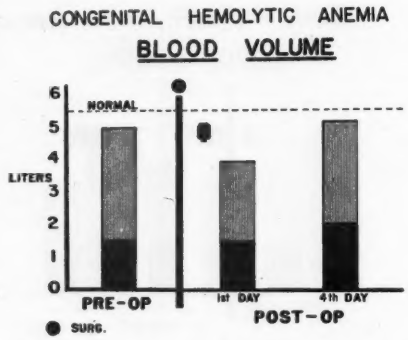


Fig. 5. Note that despite a marked deficit in red cell mass (black) there is a compensatory increase in plasma volume (striped). Adequate oxygen during anesthesia permits safe surgery without preoperative transfusions.

Splenic Neutropenia and Panhematopenia.—Blood volume deficits have also been noted in patients with splenic neutropenia and panhematopenia. However, the indications and contraindications to transfusions in this group will be determined by the hematologist. Every effort should be made to correct infections in patients with splenic neutropenia; this may require preoperative antibiotics. Since the splenic neutropenia frequently leads a cyclic course, splenectomy is often delayed until a time when the white count is at its highest peak.

A number of patients with splenic neutropenia or secondary hemolytic anemia have in addition had cirrhosis of the liver with portal hypertension. If esophageal varices exist the same precautions with naso-gastric intubation are carried out as followed in those patients with thrombocytopenic purpura. In all patients, prothrombin levels should be brought to the highest possible value with the use of parenteral vitamin K.

ACTH and Cortisone.—When adrenocorticotropic hormone (ACTH) and cortisone became available in early 1950 for the treatment of various hematological disorders, it was considered that there would be a change in the indications for splenectomy for hypersplenism. Figure 6 shows that despite the utilization of these drugs in a large number of our cases, the average yearly number of splenectomies for hypersplenism remains

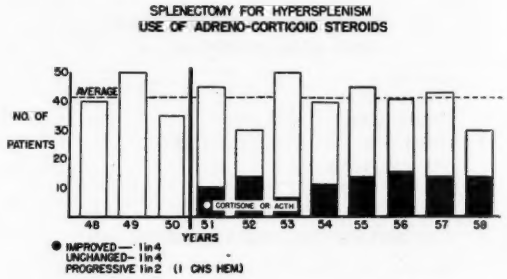


Fig. 6. The number of patients receiving steroid therapy are shown in black. The relatively poor response has not encouraged our hematologists to rely on these drugs in preference to splenectomy in most patients with hypersplenism.

unchanged. The decrease in 1951 is probably due to the temporary results of these medications. Unfortunately, the recurrence of purpura, neutropenia, and hemolytic anemia after discontinuance of these drugs is common. A recent evaluation by Doan, Bouroncle and Wiseman[8] of the results in cases treated with ACTH and cortisone has shown a two-fold increase in postoperative complications when surgery follows their use. They, therefore, hesitate to use steroids without great care and discrimination in patients with a classical hypersplenic cytopenic syndrome.

In some cases of hypersplenism ACTH and cortisone give dramatic remissions and for this reason their value in preparing patients for surgery must be considered in poor risk patients. They usually make possible the delay of surgery until the patient is in the best possible condition. Finally, when splenectomy fails, particularly in patients with acquired hemolytic anemia or thrombocytopenic purpura, these drugs should certainly be tried.

Operative Considerations

Splenectomy should be carried out utilizing a meticulous technique with individual ligation of bleeders and firm compression of wound edges to prevent oozing during the operative procedure. Early ligation of the splenic artery has been carried

out in all the elective splenectomies for hypersplenism since this usually makes possible the giving of whole blood transfusions to patients with hemolytic anemia and may dramatically decrease the oozing tendency of those patients with thrombocytopenic purpura. In addition, subsequent blood loss during the course of splenectomy is usually decreased. Great care should be taken to prevent injury to the tail of the pancreas during the removal of the spleen, and individual ligation of the vessels of the splenic pedicle should be carried out. The splenic vein is usually the last of these vessels to be ligated since its identification and preservation may be important for its utilization in a spleno-renal shunt in patients with portal hypertension. At the completion of splenectomy and following a careful repeated search for accessory spleens, biopsies are routinely taken of retroperitoneal lymph nodes, liver, and mesenteric lymph nodes.[7] Those retroperitoneal nodes along the border of the pancreas are readily accessible. These biopsies have established the correct diagnosis in 22 per cent of our cases of secondary hypersplenism. Without the aid of these biopsies, which have shown on pathological examination some other chronic disease process, the diagnosis would have remained one of primary hypersplenism. Accessory spleens have been found in approximately 20 per cent of our patients with primary hypersplenism as compared to 16 per cent in those with secondary hypersplenism.

The surgical risk in primary hypersplenism is less than that in secondary hypersplenism. The mortality in primary hypersplenism has been only 1.9 per cent. Poor liver function, chronic diseases with poor nutrition, lowered vital capacity and the increased age of the patients with secondary hypersplenism have increased the mortality in this group to 13.6 per cent.

Postoperative complications have been twice as common in patients with secondary hypersplenism. Pulmonary complications and postoperative bleeding, either intra-abdominal, into the wound or from the varices, have been the most common complications and accounted for a majority of the deaths. Cerebral hemorrhage, present before surgery in a few patients with purpura, has been a cause of death in one patient. Pancreatitis may present a serious problem following splenectomy, so that great care should be taken to prevent pancreatic injury during splenectomy. Pancreatitis has accounted for two of our postoperative deaths. Leakage of pancreatic juice or the formation of a pancreatic fistula, however, has not been a problem, so that we have not drained the pancreas following splenectomy.

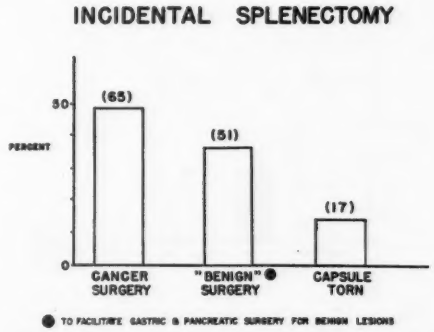


Fig. 7. The second most common indication for splenectomy is called incidental since the spleen is removed as a part of another surgical procedure.

Despite the marked rise of blood platelets following splenectomy, phlebitis or thrombo-embolism has not been a common complication. Two patients have developed mild superficial phlebitis of the lower extremities and one patient developed chest pain after discharge from the hospital, but pulmonary embolism was not proven. We, therefore, have not utilized anticoagulants prophylactically in the post-splenectomy period.

Incidental Splenectomy.—When the spleen is removed while performing another abdominal or thoraco-abdominal procedure, this may be termed "incidental splenectomy" (Fig. 7). Splenectomy in combination with radical upper abdominal surgery for cancer has become a commonly accepted procedure during recent years. This has been our most common indication for incidental splenectomy. Of 133 incidental splenectomies over half have been performed to facilitate the surgical removal of the stomach, pancreas, lower esophagus or colon for carcinoma.

Although it can be accepted that splenectomy is usually necessary when the body and tail of the pancreas are excised for benign lesions, the removal

of the spleen during subtotal gastrectomy for ulcer may not be so readily accepted. We have not hesitated to remove the spleen in these cases when this organ interferes with adequate mobilization

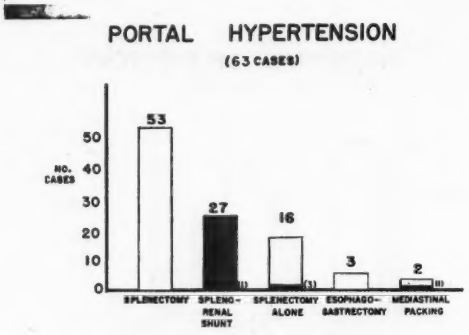


Fig. 8. The number of cases and procedures performed in sixty-three patients with portal hypertension. The figures in parentheses indicate mortality.

of the stomach or when it was considered that the spleen might, by its weight, place tension on a gastro-intestinal suture line. Adhesions of the spleen to the diaphragm may cause tears in the capsule when traction is applied to the omentum or gastric pouch during gastric resection. While performing elective gastrectomy, or in a few cases when the left colon was excised, the capsule of the spleen was torn and splenectomy became necessary.

Although the spleen can usually be readily removed while performing other major upper abdominal surgery, any change in morbidity or mortality thereby produced is of importance. A 13.5 per cent mortality was found in those patients in whom incidental splenectomy was performed. All deaths were in patients undergoing either radical gastrectomy with partial pancreatectomy or esophago-gastrectomy for cancer. It is difficult to match these with comparable cases where splenectomy was not performed since splenectomy was necessary in the more extensive cancer operations. However, no deaths and no increase in postoperative complications were noted when splenectomy was performed during elective gastrectomy or during procedures for benign disease after the capsule was inadvertently torn.

Portal Hypertension.—During recent years, a number of surgical procedures directly or indirectly associated with the spleen have been advocated in the management of portal hypertension. Fifty-three splenectomies have been performed and in thirty-three of these cases another procedure has been utilized in addition to splenectomy (Fig. 8). Splenectomy alone was performed on sixteen patients for portal hypertension and hypersplenism with one death. Either because gastrointestinal bleeding was not a problem, portal pressure was not greatly elevated, or induration of the splenic vein was great, a venous shunting procedure was not carried out in these patients.

Portocaval venous shunting procedures have become one of the most popular approaches to the treatment of portal hypertension during the past decade. For this reason we have utilized a meticulous technique of splenectomy which includes careful dissection of the hilum with individual ligation of the vessels leaving the splenic vein as the last vessel to be ligated so that it then is readily available should a splenorenal venous anastomosis be considered indicated. Portal venous pressure should be measured when hypertension is suspected. Twenty-seven splenorenal shunts have been performed with only one death (4 per cent). The majority of these patients had active hypersplenism associated with portal hypertension. In a one to seven year follow up there have been only four cases (17 per cent) with recurrent hemorrhage. Twenty (80 per cent) are living and sixteen (64 per cent) are working.

Esophagogastrectomy has been performed three times. Although these patients have done well immediately following their surgery we have not adopted this extensive procedure as the one of choice for patients with esophageal varices. Several years ago we tried mediastinal packing to control esophageal varices as advocated by Garlock;[9] however, animal experimentation in our surgical laboratory did not suggest a definite value for this procedure so that it has been discontinued.

Traumatic Rupture.—Traumatic rupture of the spleen is probably one of the most common indications for splenectomy throughout the country. Our experience, however, has been limited (Fig. 9). Our mortality may be higher than in clinics where splenic rupture is more commonly seen, but this finding has stressed, at least for us, the im-

portance of associated injuries as a cause for death in patients with rupture of the spleen. In all patients with rupture of the spleen in whom death occurred, injury to the brain, heart and lung, and abdominal viscera or multiple fractures were the most important causes of death. In a recent review of 200 patients with 273 abdominal injuries we found that multiple extra abdominal injuries were present in two out of five patients.[10] Also one out of five had more than one intra-abdominal organ injured.

With early use of whole blood transfusions and the rapid transit time of injured patients from the site of injury to a hospital emergency clinic there should be no mortality from an uncomplicated splenic rupture. However, a low mortality can be anticipated only if the diagnosis is suspected early. Shock in the patient with head injury and persisting shock after what has been considered adequate blood replacement for fractures point to internal hemorrhage. Abdominal roentgenograms are frequently of little help. When abdominal pain and tenderness exist a needle puncture paracentesis should be performed, utilizing a number 20 or number 18 gauge, long spinal needle, in the search for blood. Finally, splenectomy for splenic rupture is an inadequate operation without careful exploration for other organ injuries.

Summary

The indications for splenectomy have increased with better knowledge of normal and abnormal liver and splenic physiology. Splenectomy is indicated in the management of hypersplenism, portal hypertension and splenic rupture, and in facilitating other major abdominal surgery. The incidence of splenectomy will vary according to the interests of surgeons and hematologists in a particular area. In surgery for hypersplenism the diagnosis must be confirmed by the hematologists through study of both the peripheral blood and bone marrow. Careful pre-operative preparation of the patient is important regardless of the indication for splenectomy. Consideration must be given to the need for pre-operative correction of blood volume deficits and to the management of concommitant abnormalities, such as associated injuries with splenic rupture of chronic debilitating diseases with secondary hypersplenism. A careful technique of splenectomy should be performed which follows the principles of adequate exploration for associated injuries in cases of trauma and a meticulous technique in elective splenectomy. In the latter cases a careful search should be made for accessory spleens and the splenic vein should be dissected out for utilization in a spleno-renal shunt if portal hypertension is found.

Uniformly good results will follow accurate diagnosis combined with careful hematological evaluation, close attention to pre-operative preparation and a careful splenectomy.

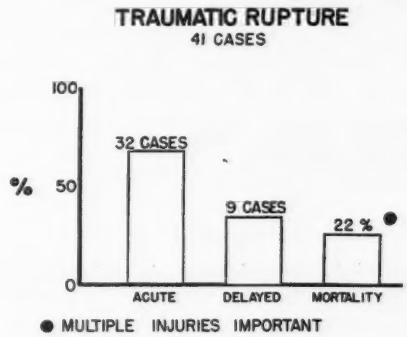


Fig. 9. Only forty-one cases of splenic rupture have required splenectomy. The high mortality is due to multiple injuries.

References

1. Doan, C. A.: Hypersplenism. Bull. New York Acad. Med., 25:625, 1949.
2. Wright, C. S., Doan, C. A., Bouroncle, B. A., and Zollinger, R. M.: Direct splenic arterial and venous studies in the hypersplenic syndromes before and after epinephrine. Blood, 6:195, 1951.
3. Dameshek, W. and Welch, C. S.: Hypersplenism and Surgery of the Spleen. New York: Grune and Stratton, Inc., 1952.
4. Evans, R. S., Takakashi, K., Duane, R. T., Payne, R. and Liu, C. K.: Primary thrombocytopenic purpura and acquired hemolytic anemia. A.M.A. Arch. Int. Med., 87:48, 1951.
5. Wiseman, B. K. and Doan, C. A.: Primary splenic neutropenia; newly recognized syndrome, closely related to congenital hemolytic icterus and essential thrombocytopenic purpura. Ann. Int. Med., 16: 1097, 1942.
6. Doan, C. A. and Wright, C. S.: Primary congenital and secondary acquired splenic panhematopenia. Blood, 1:10, 1946.
7. Zollinger, R. M., Martin, M. M. and Williams, R. D.: Surgical aspects of hypersplenism. J.A.M.A., 149:24, 1952.
8. Doan, C. A., Bouroncle, B. A., and Wiseman, B. K.: Hypersplenic cytopenic syndrome: A twenty-five year experience with special reference to splenectomy. Presented at International Society of Hematology, Boston, 1956.
9. Garlock, J. H. and Som, M. L.: Packing of mediastinum in treatment of hematemesis due to esophageal varices. New York J. Med., 50:197, 1950.
10. Williams, R. D. and Zollinger, R. M.: Diagnostic and prognostic factors in abdominal trauma. Am. J. Surg., 97:5 (p. 575) (May) 1959.

Air Pollution

A Public Health Problem of the Community

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Presented in symposium at the Minnesota Public Health Conference, Saint Paul, Minnesota, September 19, 1958.

THE emphasis on public health problems in a community has undergone several changes since the day of Ervin Chadwick. Treatment of a water supply, proper sewage disposal, vaccination —these and other preventive measures have changed serious problems into more or less routine procedures. Whenever it appeared in the past that most of the public health problems were under control, a different problem usually developed from our changing civilization. Such has been the recently recognized public health hazard, the pollution of the air of our communities.

We are concerned about the purity of the water, milk and beverages that we drink, the freedom from harmful bacteria and other contamination of the food we eat; the sanitation and safety of the place in which we live and work and now a concern about the air we breathe. When it is considered that breathing is a normal body function that must take place regardless of the type or amount of contamination in the air, it is only reasonable that serious thought be given to the problem from a public health standpoint. A positive answer to the question as to whether a given community has an air pollution problem may depend only on the passage of time. With the anticipated increase in industrial expansion and community growth, increased use and numbers of automobiles, buses, trucks and other means of transportation, the pollution of the air in our communities will increase substantially unless or until an adequate air pollution control program is in complete command of the situation.

Dr. Paulus is Associate Professor, School of Public Health, University of Minnesota.

Community Disasters

Pollution of the air by contaminants coming from various sources is not a new or recent problem of the community. In the thirteenth century, a law was passed in England in an attempt to control the serious nuisance of black sooty smoke caused by the combustion of a cheap coal. In the 1880's the cities of St. Louis, Cincinnati and Pittsburgh adopted ordinances in an effort to control the production of excessive smoke and its accompanying ill effects. Many other cities soon adopted smoke ordinances but industrial expansion and community growth continued the problem. It was not until well into the twentieth century that several disastrous episodes focused the world's attention on air pollution and pointed out dramatically the public health aspect of the problem. These episodes occurred in communities of varying size from a population of a few hundred to one of several million showing that this type of disaster is not selective in the number of people it may affect.

Communities along a section of the Meuse River in Belgium suffered the first noteworthy air pollution disaster in December, 1930. A heavily industrialized area was situated in a narrow valley with hills forming the valley walls. A strong temperature inversion lasting for several days provided a ceiling for the valley and helped in causing an increase in the concentration of various contaminants. The health of several thousand persons was affected with a total of sixty-three deaths attributed to this episode.

In our country, an air pollution disaster occurred at Donora, Pennsylvania, in October, 1948, with a result of twenty deaths and several thousand persons becoming ill. Donora, a community of about 12,000 people, is located in an industralized valley along the Monongahela River. As in the Belgium episode, a temperature inversion retained all the contaminants from various sources in the valley for a period of over four days. In November, 1950, Poza Rica, Mexico, a community of only a few hundred persons, was subjected to an air pollution fumigation when waste hydrogen sulfide

gas was accidentally released into the atmosphere during a period of stable weather conditions. People of all ages were affected with twenty-two deaths and many persons being hospitalized. In December, 1952, London, England, experienced a week-long fog accompanied by a strong temperature inversion which virtually gave the area a 150 foot ceiling. According to valid statistical evidence, about 4,000 deaths have been attributed to this period of London Smog. These and other episodes have several things in common both in cause and effects. Among the similarities are certain air pollution contaminants, a certain type of weather condition, and topography that lends itself to the situation. Almost any community with the right combinations of weather, contamination, and topography could be subjected to a similar occurrence.

Air Pollution Sources

In order that this public health problem of a community might be better defined from a preventive standpoint, it seems necessary to discuss briefly the sources and types of air pollution contaminants. One of the major sources results from the combustion of all kinds of fuel for the production of heat, electric power and for certain industrial operations. The combustion of coal, natural gas, and fuel oil when properly done may yield dust, flyash, sulfur dioxide, fluorine compounds and other contaminants. When the combustion is incomplete, soot, smoke, carbon monoxide (in addition to the above contaminants) are discharged into the air of the community. Incomplete combustion of gasoline and other motor fuel used in the operation of cars, buses and trucks places many different kinds of organic contaminants in the air.

Industrial operations and processes are the major sources of air pollutants in the communities in which they are located. Some examples of types of industry and a few of the contaminants they may contribute to the air pollution load are as follows: steel mill—dust, carbon monoxide, iron oxide and smoke; oil refinery—hydrocarbons, mercaptans and hydrogen sulfide; grain industry—grain dust and different odors; paper plant—sulfur compounds and odors; phosphate fertilizer plant—sulfur dioxide and fluorides; foundries—dust, iron oxide and oxides of nitrogen.

Some communities, by their own policies, may add to the air pollution problem. Communities that do not provide collection and disposal of refuse, rubbish, leaves and garbage encourage the use of backyard and home incinerators. The incinerators in use today are mostly of poor design, are poorly operated and can produce large amounts of dust, smoke, various gases and odors. Communities that do not operate a municipal incinerator or a sanitary land-fill may encourage the use of a burning dump with its continuous contribution to the air pollution load. Burning of leaves on the owners lot or in the street is another pollution problem for local community control.

Effects of Air Pollution

The effects of excessive amounts of air pollution in a community are numerous, the most important one, undoubtedly, being concerned with the health of the individual. In addition, there may be adverse effects on animals, vegetation and on property, contribution to low or poor visibility, damage to clothing and foodstuffs, soiling of clothing, et cetera. These effects may be calculated in terms of monetary loss as differentiated from the loss of human life where the value cannot be expressed.

From the public health viewpoint, the adverse effect of polluted air on the individuals in the community is the main concern and depends on the degree of intensity of the air pollution present. According to Cooper and Stern[1] of the U. S. Public Health Service, "The intensity of air pollution may run the gamut from severe episodes causing death, acute exposures sufficient to cause annoyance but without provable health effects, and exposures for prolonged periods to low concentration of contaminants which may cause chronic effects still unrecognized." Several of the severe exposures for a relatively short duration have already been discussed. With the exception of the Poza Rica episode caused by the accidental release of hydrogen sulfide, the causative agent or agents for the disaster are not difinitely known. Inconclusive evidence points toward sulfur dioxide, certain fluorine compounds, other particulate matter and oxides of nitrogen as the most likely materials to have caused the deaths and illnesses. It is highly probable that it was not one agent alone but the combined action of two or more contaminants acting in a synergistic manner. It has been pointed out that most of the deaths were among persons of advanced age already weakened by other illnesses. However, persons of all ages and states of health became ill and required hos-

pitalization or medical treatment in all of these episodes and in the Poza Rica incident, the deaths occurred in the same pattern.

These severe episodes have proved that the effect of air contamination upon human life can be fatal. What about a less severe attack—either with an equal concentration of contaminants for a shorter duration or a lower concentration for extended periods? This is the area in the field of air pollution effects on human health that has not been solved in the few years of study of the problem. It may take years of work on carefully designed projects to show any definite trends. Needless to say, these studies must be quite lengthy and costly, so the number of completed studies will be small.

A good example of mild exposures to air pollution contaminants over an extended period of time is the smog problem of the West Coast principally in the Los Angeles area. Since early in the Second World War, certain health nuisance effects have been noted by the people and the problem, although possibly lessening, has not been controlled. In the Los Angeles area, the rapid growth in population and industrial development over the past several decades has increased the air pollution load contributed from many different sources. In addition, the meteorologic features of the entire West Coast, and especially the lower portion, help in making the problem difficult. The Los Angeles area, ringed by fairly high mountain ranges, has a twice daily shift in winds, usually from the mountains toward the ocean in the morning hours and the exact reverse during the afternoon and evening. In this manner, the same parcel of air receives the contamination from the many sources in the area. A persistent temperature inversion prevents dissipation of the pollutants over the mountains. The effects on vegetation, visibility and property have resulted in millions of dollars in damage. On health, the effects have not been clearly defined. Mills,[2] by means of statistical study, showed a higher-than-normal mortality during some extreme smog periods but other studies of the same data disputed his finding. Those who have experienced this smog, which is frequently characterized by the presence of a lacrimatory agent, will readily acknowledge the nuisance value. It is now generally agreed that the probable cause of the Los Angeles smog is a reaction between hydrocarbons, oxides of nitrogen and ozone or total oxidant in the air. Several studies now in progress may answer the question as to whether periodic exposures to this type of air pollution will cause permanent damage to health.

Under the stimulus of Public Law 159, 84th Congress, in which funds were appropriated for research and technical assistance relating to air pollution, a number of studies are being conducted throughout the country on the effects of air pollutants on human health. These studies may be divided into three general types: (1) community and other epidemiologic studies, (2) statistical analyses of morbidity and mortality and their possible relationship to air pollution indices, and (3) toxicologic effects of air pollutants.

The statistical studies on correlation between morbidity and mortality and certain air pollution indices will furnish information for additional investigations. Toxicologic experiments on exposures of various animals to varying concentrations of air pollutants will develop information on potential hazards on human health. Aided by the data from these investigations, the function of community and other epidemiologic studies will be to identify causative agents and to establish scientific standards for allowable concentrations of such agents in the air. The standards may vary from community to community and from one section of the country to another depending on various factors.

An investigation recently started in metropolitan Nashville, Tennessee, sponsored in part by the Public Health Service, is a good example of a community study on total health effects. This project combines a medical investigation of the inhabitants of the area and an engineering and physical science study of the environment to which the people are continuously subjected. The latter study will provide thorough and comprehensive data on the concentration of certain contaminants in subdivided areas of the community. These data will be correlated with medical findings obtained in a series of studies—including surveys of morbidity, mortality, frequency of occurrence of cardiorespiratory diseases and incidence of anthracosis. The findings of this carefully planned project should aid materially in the establishment of permissible standards for contaminants of the environment.

There are other effects on the health of the people of our communities besides those derived from inhaling contaminants or from direct irritation of the eyes. With the formation of numerous smogs in a community, the amount of sunlight reaching

the earth's surface can be reduced materially. The lessening of sunlight, besides having an effect on growth of vegetation, may also have adverse effects on humans due to a decrease in solar ultraviolet radiation. This probably can be counteracted by consuming artificially irradiated milk or by other dietary supplements containing vitamin D. There is still the possible effect of a dark gloomy day on the mental health of the people in the community. Smoke, dust, dirt, odors, soiling of clothes are a constant problem of people living in certain communities. Visualize a housewife who has hung her wash on the line, only to discover a few minutes later that oily soot has soiled all her clean clothes. Don't you think that this situation, often repeated, would have a direct relationship to mental health?

Responsibility of the Community

In many of the communities, the question at the present time is this: Does our community now have an air pollution problem? or How does one know when the contaminated atmosphere of a community constitutes a problem? An air pollution control official of one of the larger cities made this statement:[3] "In order to define the problem in more specific terms, let us acknowledge that every community has polluted air in some degree but that a community enters upon a realization that an air pollution problem exists: (1) when there is a serious effect on the general health of the community reaching the proportions of a disaster, or (2) when the nuisance from dirt, soil, fumes, and odor is beyond the tolerance of individual citizens and they become dissatisfied and express a public desire for cleaner air." The second criterion is a subjective approach and should be backed by other means of analysis. Air contamination might get progressively worse in a community with the people accepting the condition as a sign of prosperity and not raising the necessary objections to start remedial action.

Our communities should not wait for a serious episode or some other obvious indication that the air pollution threshold has been reached or exceeded. Before the problem gets out of hand, as it may in many communities in the future, certain steps may be taken to control the situation. A careful examination should be made of the complaints, potential sources and obvious effects on vegetation and property and possibly changes in the types of weather. If the local health group does not have the qualified personnel to make such a study, the State Health Department should be consulted. If necessary, the State Health Department may call upon Federal experts in this field. Along this same line, do not forget the well qualified staffs of our colleges and universities.

In setting up an air pollution program for a community, consideration should be given to the fact that the emissions from air pollution sources do not respect city boundaries. An industrial plant outside the city limits may contribute heavily to the air pollution problem in that city and the reverse is also true. Communities in certain sections of the country have formed air pollution control districts consisting of one or more counties so that all potential sources come under one jurisdiction. This should yield much better results than to have separate programs in all of the cities and towns in a metropolitan area.

There are many other aspects of a successful air pollution control program which should be mentioned. An adequate budget for salaries of trained personnel and necessary field and laboratory equipment should be established. Control legislation to fit the paticular air pollution problem of the community must be enacted. Future community planning or zoning should take into account certain factors of air pollution control—especially prevailing wind direction, wind speeds, topography and even orientation of industrial plant buildings. An educational program for both industry and the people in a commuity can be a very important part of the control program.

Conclusion

It should be stressed that the air pollution problem is not confined to large cities or communities. Some of the well known disasters in which many people died and other serious effects occurred took place in communities much below 30,000 in population. Local health departments should accept the challenge of this public health problem and plan in the future to provide a cleaner, safer air for our communities.

References

1. Cooper, W. C., and Stern, A. C.: A Symposium on Air Pollution—Public Health Aspects. Heating, Piping and Air Conditioning, p. 156 (July) 1956.
2. California Department of Public Health: Clean Air for California—Initial Report of the Air Pollution Study Project. San Francisco: State of California Department of Public Health (March) 1955.
3. Gruber, C. W.: A Symposium on Air Pollution—Practical Approach to Problem. Heating, Piping and Air Conditioning, p. 160 (July) 1956.

Radiation

An Environmental Health Factor

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THIS discussion of radiation hazard will be limited to natural radiation, fallout from nuclear weapons tests, and potential wastes from the peaceful application of atomic energy. Sources of ionizing radiation other than natural radiation are becoming increasingly important pollutants of the air, water, feed and food.

Background or natural radiation contributes to an external and an internal radiation exposure. External exposure is due to cosmic rays and gamma rays from potassium, uranium, thorium and daughter products in the ground. Internal exposure results from the ingestion of such radioactive elements as radium and potassium-40 in water or food or from the inhalation of radon and thoron gases and their daughter products released to the atmosphere following decay of parent products. Urban air pollution aerosols, on which radon daughter and thoron daughter products are absorbed, might cause increased retention and thus greater lung exposure.

It is the purpose of this presentation to review our understanding of the maximum permissible concentration of radionuclides and apply that concept to available data on the abundance and distribution of radioactivity in the environment.

Maximum Permissible Concentrations

All ionizing radiation, however small, is harmful and should be avoided.[1] The effects from exposure vary with the amount of radiation, ranging from genetic and somatic effects at low levels to the complete destruction of vital body cells at high levels. The U. S. Atomic Energy Commission and scientists the world over are making exhaustive studies on the physical, chemical, and biologic aspects of radionuclides, and national[2] and international[3] committees appraise the information as it affects the recommended maximum permissible concentration (MPC). The National Committee on Radiation Protection[2] adopted 300 millirads per week as the maximum permissible dose for occupational workers (40-hour week).

From this basic dose value, the MPC of radionuclides in air, and water (or food) were derived and reported in NBS Handbook No. 52,[2] on the assumption that each radionuclide is the sole contributor of radiation exposure other than back-

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ground. The nature of the exposure of the general public would indicate that these levels should be reduced to allow for the following:

1. Multiple sources of exposure (ingestion, inhalation, and external exposure) including medical use of radiation.

2. Composition of the general population—presence of more sensitive persons such as children and expectant mothers.

3. The increased genetic effects for total population.

The degree of reduction which should be applied for each of these variables is unknown but an overall reduction factor of 100 will be selected as a basis for this discussion. Therefore, "significant levels" (SL) of radionuclides in air and in water shall be defined as one one-hundredth of the maximum permissible concentrations, as given in Handbook No. 52.

TABLE I. SIGNIFICANT LEVELS OF RADIONUCLIDES
(1% of Maximum Permissible Concentration)

Source	Radionuclide*	Critical Tissue	Significant Levels	
			In Air $\mu\mu c/M^3$	In Water $\mu\mu c/l$
Fission products	Strontium-90	Bone	2	8
	Iodine-131	Thyroid	30	300
	Cerium-144	Bone	70	400,000
	Strontium-89	Bone	200	700
	Ruthenium-106	Kidney	300	1,000,000
	Yttrium-91	Bone	400	2,000,000
	Barium-140	Bone	600	20,000
	Promethium-147	Bone	2,000	10,000,000
	Cesium-137	Muscle	2,000	15,000
	Niobium-95	Bone	4,000	4,000
	Ruthenium-103	Kidney	7,000	100,000
	Xenon-133	Body	40,000	40,000
Natural activity	Radon-222	Body	100	20
	Radium-226	Bone	0.8	0.4

*Includes radiation effect of daughters.

The SL values for more important or abundant radionuclides formed by the instantaneous slow neutron fission of U^{235} are listed in Table I.

The significant levels (SL) for natural radioactivity of radium and radon are noted to be relatively low. Of the mixed fission products, strontium-90, iodine-131, cerium-144 and strontium-89, in that order, have the lowest SL in air, whereas strontium-90, iodine-131, strontium-89 and niobium have the lowest SL in water.

One week after fission, most of the radioactivity

resides in thirty radionuclides. The total activity decreases in such a manner that the average half-life is roughly equal to the time since formation. More specifically, the mixed fission products decay

TABLE II. SIGNIFICANT LEVELS OF MIXED FISSION PRODUCTS AS A FUNCTION OF TIME

Age of Fission Products Days	Significant Levels*	
	In Air $\mu\mu c/M^3$	In Water $\mu\mu c/l$
3.12	800	7700
6.7	450	4300
14.4	360	3300
21.1	370	3200
30.9	410	4700
66.4	390	2500
143	220	1300
438	160	260

*Calculated values using abundance data of Bolles and Ballou (4), and 1/100 of MPC values of Handbook 52 (2).

with a negative exponential factor of 1.28 until three days old, 1.0 between the ages three and thirty days, 1.2 between the ages thirty and 100 days and 1.35 between the ages 100 and 1000 days. A factor of 1.2 provides a rough estimate of decay between the ages one day and one year. Some long-lived radionuclides such as strontium are formed in small amounts soon after fission, but account for a very small per cent of the total activity until the more abundant short-lived radionuclides have decayed through many half-lives. Some parent radionuclides have long-lived daughters which grow in amount as the parent decays, whereas other radionuclides have short-lived daughters which remain substantially as abundant as their parent.

Based on the radionuclide abundance data of Bolles and Ballou,[4] and using the Handbook No. 52 formula for calculating the MPC of mixtures of isotopes, the SL values for mixed fission products of different ages were calculated.

Table II shows that the SL of mixed fission products in air varies from 800 $\mu\mu c/M^3$ for three-day-old to 160 $\mu\mu c/M^3$ for 1.2-year-old mixtures, and that the SL in water varies from 7,700 $\mu\mu c/l$ for three-day-old to 260 $\mu\mu c/l$ for 1.2-year-old fission products. Since the preponderant air particulate and fallout activity is rarely older than three months, the significant levels are in order of 300 $\mu\mu c/M^3$ for air and 2000 $\mu\mu c/l$ for rain water.

The potential removal of cerium, zirconium, and yttrium from rain water by coprecipitation on silt in streams or reservoirs would inrease the relative abundance of the more radiohazardous elements such as iodine, barium and strontium. As a consequence, the SL for the residual radionuclide mixture would decrease.

The fission of fuels other than U^{235} may also alter the relative importance of fission products, at least temporarily. The presence of bomb construction material or the proximity of bomb detonation to soil or water may induce activity of considerable abundance. Induced activity may be either short-lived or long-lived and of variable radiotoxicity. Accordingly, caution should be exercised in interpreting levels of radioactivity on mixtures whose composition has not been fully established.

Air Particulate Activity

The results of a National Air Sampling Network[5] show that the average beta activity of atmospheric particulates in the U. S., exclusive of the area within 400 to 500 miles of the Nevada test site, was 1.0, 1.75, 2.05 and 5.4 $\mu\mu c/M^3$ in 1954, 1955, 1956 and 1957, respectively.

During Pacific and foreign tests in 1954 and 1956, maximum values of less than 22 $\mu\mu c/M^3$ were observed. Generally, the levels of activity were quite uniform over large areas of the U. S., with the frequency of maximum values appearing at the Rocky Mountain, Western, Southern, Central and Eastern areas in that order. The activity decay rates in 1954 and 1956 were characteristic of mixed fission products more than two weeks and less than three months old.

During the U. S. tests at Nevada in 1955 and 1957, activity levels fluctuated greatly as each test cloud moved by a different route generally southeastward with horizontal dispersion into the South-Central states and thence in an east-northeasterly direction up the Ohio and Tennessee Valleys to the North Atlantic states. With some exceptions in 1957, the Canadian border states, the Pacific, the Atlantic, and to a lesser degree, the Gulf Coastal areas showed lower levels of atmospheric particulate activity than elsewhere. Values of 2000 to 5500 $\mu\mu c/M^3$ were observed several hundred miles from the test site on only three occasions during the five years of testing. Elsewhere, maximum values of 100 to 350 $\mu\mu c/M^3$ were observed in the Central, Southern and Western areas and 75 $\mu\mu c/M^3$ in the Eastern area. In these samples of maximum activity, the decay rate was high and characteristic of one-day-old to five-day-old fission product. One-day-old fission product, for example, decays to 10 and 1 per cent of its original activity in seven and forty-two days, respectively.

The level of long-lived alpha activity in samples of the National Air Sampling Network has been low—usually below 10 $\mu\mu c/1000M^3$, or hardly detectable by the testing procedure. On the other hand, the short-lived natural activity of radon and thoron daughters is readily detected by alpha counting samples of one-cubic meter collected over an hour's time. Depending on time of collection, 1 to 5 per cent of the alpha activity has a half-life of 10.6 hours and is identified by decay as the daughters of thoron, whereas the remainder has a half-life of thirty-one to thirty-three minutes and is identified as the daughters of radon. A number of tests have indicated that natural activity at Cincinnati, Ohio, and at Hagerstown, Maryland, fluctuate through a diurnal cycle reaching peaks during the early morning and low levels in the early afternoon. However, peak levels persist during prolonged inversion conditions and minimum levels appear associated with high soil moisture, precipitation (washout from rain or snow), freezing temperatures, and high winds (dispersion). The morning values of radon fluctuate from 80 to 800 $\mu\mu c/M^3$ with a maximum observed value of 2000 $\mu\mu c/M^3$ at Cincinnati. Afternoon or low values are rarely less than 60 $\mu\mu c/M^3$. From limited data available, the daily average concentration is estimated to be 80 $\mu\mu c/M^3$ or more.

Fallout

Cincinnati rain collectors consisting of polyethylene buckets, 7 inches in diameter, and a 2 M^2 tray are emptied (with rinsing) before, during, and after rains, and the samples tested for beta activity, decay and isotopic composition. Numerous tests indicate that 85 per cent or more of the fallout occurs as rainout or snowout.[6] Usually the level of activity does not change significantly during a storm of a few hours' duration. Dustout has been minor even when the air particulate samples have indicated high atmospheric contamination. Occasionally, however, significant dustout has been obtained several days after high rainout. This is attributed to rain fallout which has become airborne by local wind or vehicular disturbances. In a few instances, dustout decay has been characteristic of a previous rain, whereas the preponderance of air particulate activity at the time of dust collection had a decay rate characteristic of a more recent nuclear test.

TABLE III. CINCINNATI FALLOUT OF ONE-YEAR-OLD ACTIVITY

Year	Month	Rain,* (Inches)	Beta Activity (One-Year-Old**)		
			Total $m\mu c/M^2$	Dissolved $\mu\mu c/l$	Total $\mu\mu c/l$
1957	Jan.	3.0	9.0	37	150
	Feb.	3.2	10.0	55	125
	Mar.	1.2	10.0	85	310
	Apr.	6.4	22.0	35	142
	May	6.0	12.5	50	80
	June	5.6	18.0	55	124
	July	5.0	91.1	326	705
	Aug.	3.3	14.0	62	164
	Sept.	3.0	10.5	45	137
	Oct.	2.2	5.5	55	100
	Nov.	5.8	5.0	30	40
	Dec.	5.0	4.5	20	35
1957 Total		49.7	212.1	—	—
1957 Average		—	—	68	168
1956		42.0	150.4		141
1955		45.0	63.2		55
1954		36.0	37.5		41
1953		22.0	31.3		56
1953-1957 Total		194.7	494.5		—
1953-1957 Average		—	—		100

*Includes snow.
**Sr-90 activity of unclassified mixed fission product estimated at 2.3 per cent (4).

In 1957, the total fallout from 50 inches of rain (including some snow and dust) was 14.18 $\mu c/M^2$ or an average concentration of 1230 $\mu\mu c/l$. However, 12.5 $\mu c/M^2$ was only two to five days old and 1.68 $\mu c/M^2$ was ten days to three months old. Since long-lived activity presents the greater potential hazard, the Cincinnati fallout results have been extrapolated from decay data to age one year as shown in Table III.

The months of greatest fallout were April to September. These five months accounted for three-fourths of the annual fallout. This period of high fallout corresponds to the normal plant growing season!

Cistern Water Radioactivity

The water of six cisterns located within 15 miles of the Cincinnati rain collector were tested periodically in 1957—most frequently during the months of high fallout. The monthly average activity varied from 122 to 2530 $\mu\mu c/l$ at the time of collection. The annual average activity was 629 $\mu\mu c/l$. The dissolved activity ranged from 11 to 93 per cent of the total activity, with the lowest percentages of dissolved activity occurring in water collected soon after the rainout of relatively young bomb debris. The cistern samples were recounted periodically to establish the decay rate and extrapolate the activity concentration of one-year-old bomb debris. The monthly average of one-year-old activity of cistern water ranged from 10 to 129 with an annual average of 73 $\mu\mu c/l$, as compared to 168 $\mu\mu c/l$ in rain. From this it appears that over 50 per cent of the rainout is removed from the water in cisterns by sedimentation.

Stream Water Radioactivity

The State of Ohio Department of Health tests the radioactivity of grab samples collected each month from the principal streams of the State. Through the courtesy of F. M. Waring, Chief, Division of Sanitary Engineering, of that Department, the results were made available for correlation with Cincinnati rainout. The 1957 results of five stations on the Big Miami River from Venice upstream, including a station on Mad River above Dayton, a station on the Little Miami River at Newtown, and four stations on the Scioto River below Columbus were used for this purpose. Some of the stations were nearly 100 miles from Cincinnati so that the fallout at remote stations may have differed from that at Cincinnati.

The monthly average total activity from the ten stations ranged from 26 (in October) to 190 (in July), with an annual average of 70 $\mu\mu c/l$. From 35 to 70 per cent, with an average of 50 per cent, of the total activity was associated with suspended matter. When correlated with Cincinnati rainout (corrected for decay to the end of the month), only 0.6 to 25.7 per cent, with an average of 1.8 per cent, of the rainout was found in stream water indicating that natural agents, such as soil and vegetation, and decay were responsible for reducing the level of activity reaching the stream in the form of run-off or ground water. Although the high removal (98.2 per cent) is favorable to high quality drinking water, the long-lived radioactivity removed by vegetation and soil is unfavorable since the contamination may be incorporated in human and animal food by adsorption or metabolism.

Coagulation experiments performed on rain, cistern, and surface stream waters show that all of the suspended and a small part of the dissolved activity are removed by alum-lime treatment and filtration.[7] Treatment of these Ohio stream waters would yield an effluent containing an annual average of about 35 $\mu\mu c/l$ of residual beta activity. A single test of treated effluent water showed that of the one-year-old activity, the strontium-90 concentration was 5 per cent instead of 2.3 per cent expected in mixed fission product.[4] It may be predicted that the relative abundance of other (more soluble) radionuclides, such as I^{131}, Ba^{140} and Sr^{89}, would be greater in treated effluents than in mixed fission products.

Discussion

Comparing the average levels of activity in airborne particulate matter 5.4 $\mu\mu c/M^3$ for 1957 or 2.55 $\mu\mu c/M^3$ for 1954-1958 in the U. S., with the significant mixed fission product level of 300 $\mu\mu c/M^3$ for three-month-old material, it is apparent that the inhalation hazard is of minor public health significance. On the other hand, the average natural radon level at Cincinnati of 80 $\mu\mu c/M^3$, as compared to an SL of 100 $\mu\mu c/M^3$ (Table I), appears to have public health significance even though radon is a part of the natural radiation background.

It is also interesting to compare the 10 $\mu\mu c/l$ occupational MPC for radon in air with the concentrations in uranium mining atmospheres which Holaday and his associates[8] reported—maximum, median, and minimum values for seventy-nine mines were 59,000, 4100 and 70 $\mu\mu c/l$, respectively. Perhaps there are many areas of human habitation where the levels of natural radioactivity (radon and thoron) in air should be of public health concern.

In drinking water, the SL for one-year-old fission product was estimated to be 300 $\mu\mu c/l$. This level in rainout was exceeded only during one month in the last five years, July 1957. The 1957 average activity of rainout was 56 per cent, and the five-year average was 37 per cent of the SL. The trend line for rainout is increasing every year and is approaching what may be considered a

significant level. However, natural purification of cistern and surface waters lowers the water hazard since (a) half of the rainout is removed by sedimentation in cisterns, (b) only 2 to 3 per cent of the rainout is found in stream water, and (c) half of the stream water activity may be removed by conventional water treatment using alum-lime coagulation and filtration.

Should treatment of water for the removal of rainout be necessary, filtration and ion-exchange appear promising for waters low in calcium and magnesium. Filtration with alum coagulation would be effective in removing the suspended activity, and cation exchangers have high capacities for removing dissolved fission products in water of low hardness. Lime soda-ash treatment to precipitate fission products together with calcium and magnesium appears more promising for removing radioactivity from hard waters.[9]

The geological composition of water-bearing strata with respect to uranium and thorium should be reviewed, since well waters may contain significant quantities of radium or mesothorium and their daughter products. A knowledge of the geological formations and representative testing of well waters for radon daughters and radium should provide information for an assessment of their public health significance and of any need for removing excess amounts of natural activity.

Contributions of radiation to air, water, and the rest of the environment from nuclear reactor operations, the peaceful application of radionuclides, and chemical processing of spent nuclear fuel require special consideration, but these are areas where the hazard can be minimized by judicious site selection, determined by monitoring environmental samples, and controlled by providing adequate treatment of wastes.

Off-site monitoring stations should collect samples, measure radioactivity, and discriminate local sources of radiation from bomb debris and background. Bomb debris activity in airborne particulates is an indicator of high potential fallout during inclement weather, but rain collectors are more reliable for determining fallout and knowing when and where environmental samples such as water, vegetation, animal matter, and soil samples should be collected and assayed.

Summary

Significant levels of unclassified mixed fission product in air and water from the slow neutron fission of U^{235} have been calculated. The rate of decay of mixed fission products is utilized to characterize air particulate and fallout activity.

Airborne particulate radioactivity in the United States during the last four years represents a fractional part of what may be termed a significant level of contamination.

Fallout (rainout, snowout, and dustout) during the last five years represented contamination equal to 30 to 40 per cent of the significance level, but natural purification in cisterns and in surface waters substantially reduced the contamination.

Natural radioactivity due to radium and mesothorium and their daughters may present potential radiation hazards in air and water, and warrant more extensive investigation.

More extensive fallout studies are needed to determine distribution and the relation of fallout to the contamination of food and feed.

References

1. National Research Council: Pathological Effects of Atomic Radiation. Washington: National Academy of Sciences—National Research Council, Publication 452, 1956.
2. Subcommittee on Permissible Internal Dose of the National Committee on Radiation Protection: Maximum Permissible Amounts of Radioisotopes in the Human Body and Maximum Permissible Concentrations in Air and Water. Washington: National Bureau of Standards Handbook No. 52 (March) 1953.
3. International Commission on Radiological Protection: Maximum permissible radiation exposure to man—a preliminary statement. Am. Ind. Hyg. Quart., 18:73 (March) 1957.
4. Bolles, R. C., and Ballou, N. E.: Calculated activities and abundances of U^{235} fission products. USNRDL-456 (Aug. 30, 1956).
5. Setter, L. R., Branson, B. M., Coats, G. I., and Tabor, E. C.: Five-year summary report on the radioactivity of air particulates—National Air Sampling Network. Robert A. Taft Sanitary Engineering Center (in preparation).
6. Setter, L. R., and Straub, C. P.: The distribution of radioactivity from rain. Tr. Am. Geophysical Union, 39:451 (June) 1958.
7. Setter, L. R., and Russell, H. H.: Chemical coagulation studies on removal of radioactivity in waters. J. Am. Water Works Assn., 50:590, 1958.
8. Holaday, D. A., Rushing, D. E., Coleman, R. D., Woolrich, P. F., Kusnetz, H. L., and Bale, W. F.: Control of Radon and Daughters in Uranium Mines and Calculations on Biologic Effects. U. S. Public Health Service Publication, No. 494 (1957).
9. McCauley, R. F., Lauderdale, R. A., and Eliassen, R.: A Study of the Lime Soda Softening Process as a Method for Decontaminating Radioactive Waters. AEC doc., No. NYO-4439 (1953).

Radiation and Human Genetics

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SOON after the discovery of radium and x-rays, physicians and others got radiation sickness and some died. As these deaths occurred, it became obvious that large doses of radiations to the whole body caused death, and that shielding and proper safeguards against death to the operators were necessary. Consequently, the grossest hazards were quickly remedied and not much further attention was paid to the dangers of irradiation for many years.

It is rather odd that one must obtain a prescription from a physician to purchase all sorts of relatively innocuous materials such as histamine diphosphate or banthene, while anyone can buy and operate a death-dealing x-ray machine if by chance he should have the money and the inclination to do so. Fortunately, most people who buy x-ray machines know how to take proper precautions and it is hoped that before long the State of Minnesota Board of Health will be in a position to require registrations for all x-ray machines and have safety control over them.

As a result of the bombing of Nagasaki and Hiroshima, it seems clear that a dose of 500 r. spread over the whole body will cause the death of half of the people so exposed and within a few years time after the exposure. All of those receiving this diffused whole body dose will be very ill with radiation sickness (rise of temperature, falling out of the hair, vomiting, et cetera. But if the rest of the body is shielded, a dose of 3,500 r. (or more) can be directed to a particular spot, such as the cervix, in order to destroy the cancer cells at that site. The chromosomes in the cancer cells are broken to bits by this large dose, thus preventing further growth and division of the cancer cells and also, of course, of normal cells which happen to be in the path of the x-rays.

The radiation from the bombing of Hiroshima and Nagasaki was responsible for the production of abnormalities in some fetuses in gestation at that time. The most obvious damage to the embryos was to their front ends and resulted in microcephaly; that is, much arrested development of the brain with resulting idiocy.

Everyone must agree that large doses of radiation received from accidents or from bomb explosions could only be disadvantageous and perhaps lethal. The area which is less well understood concerns the effects of small doses of radiations on man.

There is *not* agreement as to whether a small dose of radiation can trigger off leukemia or bone cancer or decrease longevity. Possibly a threshold dose, that is, a minimum amount, is necessary in order for these damaging effects to appear. It *is* known that chronic radiation of only 1 r. per week results in the loss of white blood cells.

It is very clear, however, and there *is* general agreement, that any amount of radiation, no matter how small the dose, increases the *rate* of genetic mutation (that is, permanent change) in the population. It is my purpose today to describe something of the nature of what is now a vast subject in itself, which may be called "Radiation Genetics."

In the late 1800's, August Weismann went to elaborate lengths to show that mutilations of the body such as cutting off the tails of mice did not affect the germ plasm or heredity of the individual.

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The idea grew that the gonads were perfectly insulated from the environment and that man and the other forms of life were unchangeable. In the twentieth century, biologists began to suspect that Weismann's theory, which considered the germ plasm to be inviolate, was incorrect. It was obvious that sports or mutations arose all the time, at a very low rate to be sure, and that something must be causing them. The technical difficulties of proving that mutations did occur were very large, but by 1927 proof was in hand that radiations were one agent which could produce mutations. The beautiful experiments which showed this were designed and executed by Professor H. J. Muller who later received a Nobel Prize as a reward for his success.

Muller proved, in the laboratory animal, *Drosophila melanogaster,* that there was a precise linear relationship between the roentgens of radiation put into the animal and the number of mutations shown in its offspring. The larger the dosage, the more mutations produced in the offspring. Sturtevant and Beadle have produced an estimate that in *Drosophila,* the laboratory fruit fly, every increment of 350 r. adds 1 per cent to the number of recovered mutations of the x-chromosome. This would be tripled at least if the other chromosomes were included. Mice have been found to be fifteen times as sensitive to radiations as *Drosophila* and perhaps man is even more sensitive than mice.

Bender[1] x-rayed tissue cultures of human cells with low doses and found that only 3.3 r. were required to double the number of chromosome breaks or mutations found in the control tissue culture cells. If this is true, that it only takes 3.3 r. to double the breakage in tissue culture cells, it means that the 10 r. recommended by the National Research Council as the maximum permissible dose which a person should have during his lifetime, may be too high. Members of the National Research Council did *not* say that 10 r. is safe. Indeed, this amount is certainly harmful, but it was their thinking that the resulting damage was all that society would accept. Society must accept some damage; it is only a question of how much it will pay for the advantages of radiation.

The reasoning of the expert committee of the National Research Council is based on the following data. It is estimated that 4 to 5 per cent of all live births in the United States have gross defects such as mental deficiency, congenital malformations, defects in vision and hearing. Of these about half appear to be of simple genetic origin. They are due to present or past mutations just like those produced by radiations. Consequently, of the next generation of 100,000,000 births in the United States, something like 2,000,000 of the generation will experience genetic defects of the sorts listed just now. According to the best data we have, the addition of 10 r. of man-made radiation to the natural causes of mutations already present, would add some 50,000 new instances of inherited defects to the next generation, and, if this increased dosage continued indefinitely, there would ultimately be about 500,000 additional defective children per generation. Thus, the 2,000,000 gross defects of genetic origin now observed each gen-

eration, would have risen to 2,500,000 in the distant future (20 per cent rise).

This is a frightening figure but it is certainly a reasonable one and is too low if Bender's observations on tissue culture cells are completely relevant. Even if the radiation to which the United States population is exposed is raised by only 1 r. per person, an additional load of 5,000 new defects would probably appear in the next generation.

This grim picture should give us an increased respect for radiation hazards which are easy to disregard since they cannot be seen, heard, smelled, tasted or felt.

The 2,000,000 children now born each generation with gross heritable defects result largely from mutations which occurred in past generations. In such cases where the child dies or fails later to reproduce, his mutation dies with him. Each generation the mutations that become extinct are replaced by different new mutations which result from natural or man-made causes. Some of these mutagens are cosmic rays, many chemicals such as formaldehyde, medical irradiations and to a slight extent, bomb-test fallout. It is thought that each person in the United States receives during his lifetime the *equivalent*, from all sources, of about 50 r. Of this 50 r., about 4.5 r. comes from cosmic rays at our elevation (in Denver, there would be about one more roentgen due to the higher altitude), 3 to 4 r. from medical irradiations and 0.2 r. from fallout. Most of the background causes are of unknown origin.

In medical use, fluoroscopy is much more dangerous than taking films because exposure is longer and probably scattering is greater. Five seconds of fluoroscopy is equivalent to 500 pictures. Fortunately, many of those getting large doses of radiations are past the reproductive age so that mutations produced in them will not result in deaths or defects in future generations.

However, this is an appropriate place to mention the occasional practice, now fortunately on the decline, of applying 200-300 r. units to the surface of the body overlying the ovaries in the treatment of sterility. This is extremely dangerous because the dose is so large that it is hard to imagine how new mutations can be avoided. From the point of view of the next generation, it would be better to leave the woman sterile rather than ensure that she will pass on disastrous mutations to whatever offspring might be produced as a result of the treatment. This is, of course, highly exceptional.

Usual doses of x-irradiation are:

Chest 14 x 17 in. film	0.1 r.
Chest photofluoroscopic x-ray	1.0 r.
Cardiac fluoroscopy and catheterization	10-140 r.
Gastrointestinal series—6 films	10-20 r. per minute
Gastrointestinal fluoroscopy	(5 seconds usual)
Full-mouth dental films	5.0 r.

Fortunately, not much of this gets to the gonads. In order to cause mutations, it must get to the gonads if the next generation is to be affected. Mutations in other parts of the body called somatic mutations, are relatively harmless, and die with the person affected.

You may ask, "Why is it that if just one little quantum of x-ray energy hits a chromosome in one sperm and this sperm happens to fertilize an egg, that the resulting child may die, be an achondroplastic dwarf or be damaged in some way?" The answer is that the chromosome that was hit by the x-ray will be in every single cell in the whole body of the child and thus will create its effect in every cell. Furthermore, the dwarf, if he has any children, will pass on the mutated chromosome to half of them. Thus, the damage is passed on for more than one generation, though eventually the mutant chromosome will be eliminated from the population.

Why are mutations always thought of as being harmful? If you throw a monkey wrench into a smoothly running motor there is a very large chance that you will damage it and only a small one that you will make it run better.

Finally, admitting the dangers of careless use of radiations and the resulting damage, where does this fit into the whole picture which includes the tremendous advantages of the harnessing of irradiations, that is, atoms for peace?

No one would suggest that x-ray machines be abolished. Radiant energy is here to stay. The only sensible attitude is that of the balance sheet of business. We must increase the profits by cutting the costs. Rigid safety precautions are the only answer and every physician should always have this foremost in his mental picture of his x-ray equipment.

Reference

1. Bender, Michael A.: X-ray induced chromosome aberration in normal diploid human tissue cultures. Science, 126:194-195 (Nov. 8) 1957.

The Cardiac Patient

Employment in Industry

● *The role of the personal physician, his industry, and union, are important not only in helping the cardiac patient recover from his acute illness but also in planning the patient's future employment and livelihood.*

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THE employment of cardiac patients, particularly those with coronary disease is becoming an increasingly important medical problem, in addition to having far-reaching social and economic implications for the individual, his family, and his community. The constantly increasing average age of our population, together with better diagnosis and improved care of the patient with coronary disease has steadily increased the number of such patients in the employable age group. Recent figures show that about three quarters of a million new cases of coronary thrombosis recover sufficiently to be able to go back into industry each year. This is an impressive figure, and therein lies the problem. We also know that about 75 per cent of men in the United States at the age of twenty-one have significant amounts of coronary arteriosclerosis, and this of course means that the problem of employment of the cardiac patient may be expected to increase rather than diminish. This figure also suggests that at least 80 to 85 per cent of men at age forty have some coronary disease. Routine electrocardiograms at age forty taken at the Twin Cities Arsenal show that approximately 7 per cent of those individuals have significant abnormalities. These statistics are of concern to members of industrial management. If industry interpreted these facts rigidly, one logical conclusion would be to eliminate from employment all men over the age of forty. This is so obviously irrational from the standpoint of either common sense or our national economy that other solutions to the problem must be explored.

What problems do we face in the employment of the cardiac patient, and how can they be solved?

The major problem is that of fear—fear on the part of the coronary patient that he will injure himself or precipitate another attack by working. This fear can be dispelled. There is evidence to show that at least 65 to 70 per cent of all post-coronary thrombosis patients go back to their former jobs no matter what those jobs were. Patients must be reassured concerning this matter and concrete examples should be cited.

One sound step towards dispelling these dangerous fallacies has been through the organization of "Coronary Clubs" throughout the country. They consist of individuals, both lay and professional, who have had myocardial infarctions and who are trained in the indoctrination of others in the proper attitude towards their disability. Properly directed and oriented, these club members can be most helpful in improving the mental attitude of persons newly stricken. Such a club is now being currently formed under the auspices of the Minnesota Heart Association and they will soon be able to assist in this problem.

Industry is also fearful. They know about the compensation losses. They are faced with the practical problem involved in employing an individual who must, at times, be limited in his efforts. They hesitate to invest a considerable training period in such an individual. Now that medical care and sick benefits have been added as a fringe benefit in many industries, it becomes obvious that management does not want to load its insurance program with individuals who might be poor risks in such a plan.

Labor also has its fears. One certainly is the fear that physical disabilities cause unemployment for the individual. Labor is jealous of its seniority system and the right to maintain a position despite a physical handicap. Yet some of its interpretations discriminate against the union member who could possibly do less active work providing adjustments of seniority rules could be satisfactorily worked out.

Labor is being faced more and more with a problem growing out of the spread of welfare plans. If disabled union members cannot go back

to work they are dependent upon the welfare plans supported wholly or in part by union contributions, and it is easy to see that long-term disabilities of a number of workers can be a constant drain upon those welfare funds.

Probably one of the major factors in employment of the individual with a cardiac ailment involves workmen's compensation. Originally these laws were enacted to protect the employee and his family if the employee suffered death or disability while on the job. These laws were designed to mitigate the appalling industrial accident and death toll; they were, for the most part, liberally drafted and liberally interpreted. They unquestionably favored the employee. As long as compensation laws concerned themselves with true accidents only, there was no great problem. However, in recent years, these laws have been progressively enlarged and their interpretations have also been widened. Heart disease, particularly coronary disease (a process of degeneration), has now been brought within the scope of this law. Some states rule that occurrence of a coronary thrombosis at work has a direct cause-and-effect relationship. Special groups, particularly firemen and policemen, have been provided for under the laws of some states. The laws in those states provide that any heart disease occurring in an individual belonging to such a specified group is automatically presumed to rise out of his employment and thus is an automatic matter of compensability. However, these laws do not specifically state anything concerning heart disease aside from their application to these special groups. It is a matter of interpretation of the law by workmen's compensation boards. The tendency of these boards and the legislatures has been to favor the employee's position, and in so-doing, benefits and coverage are being extended to more and more individuals for more and more disabilities. Naturally, employees with heart disease have fallen into this liberalized interpretation of the present workmen's compensation laws.

I am interested and concerned with the attitude and philosophy of the physician towards workmen's compensation problems. We are all familiar with the physician who always testifies on the side of the plaintiff and the physician who always testifies on the defendant's side. The actual facts in each case are usually perfectly clear and uncontested. Therefore, the widely differing opinions of several physicians facing the same admitted facts must depend on other factors besides the evidence. In other words, the philosophy, background and training of the individual physician causes him to interpret facts differently than his colleagues. One might speculate whether or not the physician who always appears for industry feels basically insecure and is bolstering himself by linking himself with a large corporation. One may also speculate if the physicians who always appear for the plaintiff have an inherent dislike of "big business" and feel that they must champion the cause of the oppressed. Whatever may be the reasons, the practical result is that testimony before an industrial commission or before a court becomes a contest. One physician looks at the case and decides that the evidence favors the plaintiff, and when he appears in court that physician sees no shade of gray. Things are either black or white; the same of course can be said for the physician who appears for the defendant.

Similarly there are differences between the private physician and the industrial physician. In my own case, I find I have what might be called a case of medical schizophrenia, for I find myself arguing on both sides of the question. As a physician in private practice I advise my patient with coronary thrombosis to go back to work. I have told him that he can return to his original job with no injury to himself or to his fellow workers, and that he will have no difficulty. Then I swing my chair around and as an industrial physician I see that same patient, and tell him that I cannot employ him in the industry where he originally worked; that because of his coronary thrombosis I cannot place him back in the work he formerly did because the industry wishes to protect itself. Obviously, if I am thrust into this awkward, perplexing, and somewhat frustrating experience as an individual, there is ample and justifiable reason to expect even wider and sharper differences to occur between several physicians who are wedded even more irrevocably to their points of view than I am.

In an attempt to crystallize the viewpoints of physicians on this problem, Ehrlich conducted a poll of internists and cardiologists and reported his findings.[1] He sent out a questionnaire to these hundreds of physicians and obtained their answers. The following are the conclusions:

1. Work does not produce heart disease (vote 94 per cent to 1.5 per cent).

2. Coronary arteriosclerosis or some form of

coronary disease must have pre-existed in an indivdual who suffers a coronary occlusion and myocardial infarction (vote 93.4 per cent to 6.3 per cent).

3. Performance of the same type of moderately heavy work without engaging in unusual exertion or strain has no injurious effect upon the heart. A myocardial infarction occurring during such work is not causally related to employment (vote 88.6 per cent to 7.1 per cent).

4. Subsequent attacks of myocardial infarction are not causally related to the first attack but to the underlying pathology of the coronary vessels of the heart (vote 82.8 per cent to 12.9 per cent).

5. Opinion on the effect of a strenuous physical exertion or emotional disturbance upon the heart was diveded (46.6 per cent considered that there was a causal relationship between strenuous work and ensuing myocardial infarction. 49.5 per cent did not believe so. Emotional factors were considered slightly more important than physical factors).

6. Opinion was divided on whether a person has a permanent partial disability after he has recovered from his myocardial infarction and returned to work asymptomatic. (45.8 per cent felt there was a disability and 47.9 per cent that there was not).

It is commonly stated by those individuals who are endeavoring to get the cardiac patient back into industry that the cost of compensation for the cardiac is minor. This is not the case. In 1949 in New York State, although the number of cases involving workmen's compensation in cardiacs was only .18 per cent of the total, the cost of those cases was 2.5 per cent. The cardiac cases averaged $9,400 each. This should dispell any thought that the cost of compensation in these cases is incidental and relatively unimportant.

There are other managerial problems beyond compensation. In most industry today a certain amount of training is needed to develop the employe to the point where he becomes a useful and productive worker. Industry is, of course, very careful in the selection of individuals for this type of training. Managers are probably not going to select a candidate for training who has a fairly decreased life expectancy or work potential. This has a marked tendency to eliminate the post-coronary patient from such a program. Industry also has another problem of not always being able to provide light work. Many industries have labor pools for example, out of which an individual can be taken to do practically any type of work. If the industry is large enough there may be sufficient light jobs to be used for this purpose; but in a smaller industry, where the employes must do various types of work, it is sometimes impossible for the industrialist to limit the activity of any given employe. Also, whatever light jobs occur are often kept for those who develop illness while in the employ of the company and these jobs are therefore given to them on return from their illness.

The unions, of course, have a very definite problem. In many cases the industry works with a so-called union hiring hall. Under this system the individual is assigned to jobs solely on a rotation basis and, therefore, whether or not he has heart disease plays no role in his right to take a job. This poses two problems. First, it is unfair to the employe himself. He might take a job beyond his physical capacity and this could aggravate his disability or even cause his death. The union in a sense takes a certain responsibility for this when it permits this individual to take the job. On the other hand, seniority is one of labor's corner stones and any changes, even though desirable from the medical standpoint, would necessarily have to be approached slowly and systematically. After all, the older an individual gets and the more seniority he has built up, the better chance he has for choosing the type of job he might like to do. Because of this, the easier, lighter jobs are given to those individuals high on the seniority list. It is unfair then, from a union's standpoint, to allow someone with a disability to circumvent the seniority list and take a lighter or easier job which others, through length of service, have a prior right to.

There are also problems in an industry where, for example, trade unions are used. Let us assume a man is a bricklayer. The only thing he can do, under his union rules, is to lay bricks. Possibly this is more than he can do because of his cardiac status and the man is unable, because of his training potential, age, or inclination, to adapt or prepare himself for something else. The union can do nothing for him if he cannot do the work of a bricklayer. In other industries where they have an industry-wide organization, it is possible to shift a man from one type of a job to another without violating union contracts.

The industrial physician giving pre-employment examinations has a problem. As a physician and

as a person he would like to see that all the individuals with coronary disease (who are able to do so) should be productively employed and continue to live a normal life with as near normal a life span as possible. On the other hand, he is charged with reducing the compensation losses in his industry. Knowing the facts as they exist today, he must, therefore, reject such individuals unless he can be absolutely sure that the work to which they will be assigned will not in any way contribute to disability or death for the employe.

It becomes imperative, therefore, that the industrial physician know the work requirement of the various positions within his industry so that he may adequately place those individuals he finds able to work.

Employment of the cardiac is without question a major industrial and medical problem. However, changes can be made to improve opportunities for this large group. The first step involves changes in the interpretation of the compensation law. Actually, we are dealing here with a degenerative disease, a disease which begins in early life and progresses with age. Because of this chronic degenerative process associated inevitably with aging, it would seem that this type of disease falls in a different category than a broken leg or an injured back. It would seem that we should have entirely different interpretations of this illness.

Attempts have been made to decrease the liability on the individual employer. In Minnesota we have a "second injury law" patterned after laws in other states. This law at the present time has several provisions. First, the employer must list with the industrial commission the physical or mental defects of his employes. Second, in the event of an accident involving an individual already listed as having a pre-existing disability the employer may apply for reimbursement for the increased cost incurred by reason of the original disability. Third, in no event shall the employer be liable for more than 104 weeks of compensation and the medical costs in such a case. Relief beyond this will be obtained from the second injury fund. This has been held out as a hope to industry in the case of cardiac patients but in my opinion it is not adequate. Actually, as we know from the opinion of physicians in the poll by Ehrlich, coronary thrombosis does not occur except in those individuals who have pre-existing artery disease. In other words, coronary thrombosis always is a second injury. It is never a first injury and, therefore, under those circumstances should always be listed under the second injury fund. Under our present law, however, the employer must list with the industrial commission the fact that the individual had a defect prior to the incident which is requiring compensation. If the employer wishes to do this correctly at the present time, he will very frankly state that all of his employes have coronary disease. At least he will be correct in 85 per cent of them. This of course is a farce and, therefore, the only solution is to amend this law so that all cardiac disease is listed as a second injury and never as a primary injury. Although this would relieve the employer somewhat, it still would not relieve him entirely because he still would be faced with 104 weeks plus the medical and hospital cost and this can easily amount to $8,000.00 or more in each case.

I believe there is another solution to this problem. It would seem to me that at no time is a coronary thrombosis entirely the result of anyone's employment. Neither is a coronary insufficiency resulting in death entirely due to the work of the moment. These individuals have pre-existing disease to a great extent and some incident comes along to change the course of events. It would seem that instead of things being either black or white, there are shades of gray involved. Even though a man develops a coronary insufficiency as a result of heavy work and dies, not all of this is due to the work of the moment. Much of this difficulty was related to the coronary disease and the marked narrowing of the coronary arteries which was pre-existing. In other words, it would seem more logical that we allocate 10, 20, 30, 40, or 50 per cent or even more of a man's death as a result of the effort at the time, and that the remaining percentage be judged as the result of the existing disease and not assessed totally to the job. We would then be in a much better position to judge this more equitably than we do at the present time.

The second thing we ought to do is avoid the contest type of medical testimony. As we have previously discussed, certain doctors are always on one side of the fence and certain others on the other. It would seem to be much wiser to have these cases judged by a panel of doctors as illustrated by the Utah plan. In this procedure, a panel of cardiologists is selected in a rotating fashion. They hear the evidence and render a decision. The compensation court so far has always accepted the panel's recommendations for

compensation, even though the board is not obligated in any way to be bound by the panel's decision. This avoids the contest type of testimony in court and gives a more responsible judgment of the case.

The establishment of a work classification unit would also appear to be a useful step. These units, and there are now about fifty throughout the country, are composed basically of a physician, a medical social worker, and a vocational counsellor. Other professional disciplines may be represented, too, but these three are the central personnel. A work classification unit does not diagnose, treat, or cure heart disease; it is an adjunct to the physician in his effort to see that the patient he treats is placed on a job that is no danger to the employe himself or to his colleagues. One of the amazing results of the work of these units is that the carefully kept records of two major centers revealed that over 2,000 clients were successfully placed in jobs and that not one single claim arising out of workmen's compensation occurred in this group.

A work classification unit is usually attached to a hospital, accepts patients only upon the referral of a physician, and is primarily oriented towards successfully placing the cardiac patient on a job he can handle. Complete reports are sent to the referring physician after the unit makes its recommendations. These recommendations are reached after a conference of the entire staff of the unit.

The Minnesota Heart Association is currently exploring the possibility of recommending that a demonstration unit of this kind be established to see what its practicality might be to this state.

The services of a work classification unit can be a useful assist in developing another important step in employment of the individual with a cardiac ailment, which is to develop better techniques of matching the man to the job he is best able to handle. The industrial physician should become better informed about the requirements of the positions in his industry so he may adequately fit the individual to the job. For example, the use of the word "light work" is often a misnomer, because the term has so many connotations. We need to explore this more explicitly. Union rules must be relaxed as far as seniority rights are concerned and I am sure leaders of the unions realize this. They realize they have a great stake in this problem, both from the point of trying to do the right thing by the individual, and from the financial point of their own welfare fund being greatly taxed if these individuals are not put back to work in an industry. Last of all, members of the medical profession must support such a program in order to make it work. It becomes necessary that we, as physicians, do our best to support some changes in the compensation law, that we assist in changes concerning medical testimony, that we assist in the work of a cardiac evaluation clinic and try to help industry and labor make a better selection and placement of these individuals.

Summary

1. Employment of the cardiac is a major problem today and is increasing in importance.

2. Much of the difficulty comes from fear on the part of the employe, the labor unions, and industry.

3. Excessively liberal interpretation of workmen's compensation laws is a major factor in employment of the cardiac patient.

4. The individual physician's role in workmen's compensation has a most important bearing on the "contest" philosophy presently obtained in these cases.

5. Questionnaires and documented findings show that the cardiac patient can take his place in industry.

6. Workmen's compensation cases involving cardiac patients comprise a proportionately large percentage of the total costs of workmen's compensation.

7. Both industry and labor have unique problems associated with employment of the cardiac and education is needed to change some of the current attitudes which hinder the cardiac from employment.

8. Changes in workmen's compensation laws seem to be desirable.

9. The possibility of establishing a work classification unit should be explored to determine its relevance to Minnesota's needs.

10. The physician's attitude, interest, and approach towards the individual involved in employment is still the primary determining factor and his increased knowledge and perception of the complex facets of the problem is the eventual key.

11. The Utah plan for establishing a panel of specialists reviewing cardiac cases appears to have merit and should be considered for use in Minnesota.

Reference

1. Ehrlich, H. R.: The cardiac problem under workmen's compensation law. New York J. Med., 57: 1466-1472 (Apr. 15) 1957.

Common Ocular Trauma

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THE frequency with which a physician sees a specific type of ocular injury depends upon the nature of his practice. In an industrial neighborhood, foreign bodies and flash and hot oil burns would be most common. In a residential section, with a practice containing a high percentage of housewives, there would be many foreign bodies, corneal abrasions caused by brushes and infants' fingernails, and contusions due to open cabinet doors. In the event of a thermonuclear attack, radiation burns would present problems entirely different from those of everyday practice. The most common ocular injuries are those due to foreign bodies; direct blows causing abrasions, contusions, and lacerations; and thermal, chemical, or radiation burns.

The presence of anything in the eye which does not belong there constitutes an emergency. The foreign material must be removed by the handiest and safest method possible, usually by irrigation with water or some other bland fluid. Educational programs for children, workers, and housewives should stress the importance of immediate and copious irrigation with water, milk, or any other handy bland fluid if foreign material of any type enters the eye. After this generous eye bath, the patient should consult a physician. This immediate attention will often prevent blindness, especially in the case of chemical burns.

Workers who are exposed to the possibility of flying objects or to sources of flame should wear goggles. Hobbyists and "do-it-yourselfers" should be warned to use adequate protective devices. Incidentally, any patient who is struck in the eye with a flying particle while he is using a hammer or other metallic object should be instructed to bring in the tool so that it can be tested to determine whether it is magnetic or non-magnetic. It will also be helpful to locate the particle, because it can then be matched against the tool from which it has come to see if any missing portion may still be within the eye.

This paper is directed at non-ophthalmologists who may find it necessary to treat eye injuries, either because of the nature of their practice, or because the exigencies of the situation demand

medical care before a specialist can be summoned. Visual loss which is not obviously of a temporary nature demands consultation and treatment by an ophthalmologist. Before the non-specialist can treat ocular injuries, he must be prepared to approach the eye. This demands a minimum amount of equipment, including the following:

1. Some form of magnification, preferably a loupe, consisting of a combination of plus lenses and prisms, which can be worn either as a spectacle or in a head band.
2. A source of focal light, preferably a floor lamp, which throws a narrow, bright beam.
3. A treatment tray which should contain:
   (a) cotton balls
   (b) toothpick swabs
   (c) sterile fluid for irrigation, preferably in a squeeze bottle or an atomizer
   (d) topical anesthetic (tetracaine ½ per cent, ophthane, dorsocaine, et cetera, not cocaine)
   (e) a foreign body spud or hypodermic needles which can be used for the same purpose
   (f) fluorescein for staining the cornea
   (g) lid retractor
   (h) cycloplegic (homatropine ½ per cent, cyclopentolate ½ per cent)
   (i) eye pads
   (j) scotch tape

Although fluorescein comes in bottles of 1 to 2 per cent concentration, it is preferable to use fluorescein strips which come in sterile, individual packages. Since fluorescein is an excellent culture medium for pyocyaneous, the individual, sterile fluorescein strips eliminate the dangers of contamination inherent in using bottles of the solution. Actually, the less one relies upon stock bottles and eye droppers, the less the danger of contamination. If a lid retractor is not available, a heavy bent hairpin may serve the purpose. While cycloplegics should be available, they should rarely be used by the general practitioner and never after the removal of a simple foreign body. Many patients have been practically immobilized for a week or two by a dilated pupil following a trivial injury, owing to the unnecessary instillation of atropine.

It is mandatory to obtain a history of the accident, preferably from the patient himself, at the first visit, before "compensationitis" has had a chance to set in. It is amazing how often a simple foreign body in one eye will cause a need for reading glasses in an individual over forty. He has consciously or unconsciously neglected to do anything about his presbyopia before the accident, but is now convinced that it was caused by the foreign body. Also, long after the accident has occurred, the patient is frequently persuaded that the rich insurance companies are in a better position to take care of him than he is. If possible, vision with and without glasses should be determined and recorded before the eye is handled. Prognosis should not be discussed until the outcome is certain.

Every physician should learn how to evert the upper lid. It is important to have complete control of the patient. If the upper or lower lid is held firmly against the superior or inferior bony margin of the orbit, the patient will be unable to close his eyes when he squeezes. A head rest makes immobilization easier.

Whenever the cornea is involved, it should be stained with fluorescein so that any denuded areas may be more effectively highlighted. A drop of fluorescein is instilled into the anesthetized eye. After waiting a minute, the eye is irrigated with sterile saline or water. It is advisable to place a plastic apron of the type used in beauty parlors around the patient's neck. People resent having their clothes saturated with irrigating solution, especially if it is tinged with fluorescein. In addition to the major advantage listed above, the use of fluorescein strips will diminish this possibility. The patient is asked to look up, and the fluorescein strip is placed inside the lower lid of the anesthetized eye, which is then closed for a few moments. Irrigation is unnecessary. The eye is then examined with good focal illumination and magnification.

Following are some important points to remember in examining an eye, in addition to those that have been mentioned above.

1. Always evert the upper lid, since foreign bodies commonly tend to lodge on the shelf just inside the upper lid border.

2. If a foreign body cannot be found, hold the everted upper lid up while the patient looks down, and explore behind the lid with a moistened, tightly wound, cotton toothpick swab to ascertain if any foreign material is lodged in that blind area of the cul de sac.

3. Irregularity of the light reflexes on the cornea or loss of the normal mirror-like relucency of the cornea indicate corneal injury ar edema.

4. Blood in the anterior chamber, dilation or paralysis of the pupil not due to medication, distortion of the pupil, or subconjunctival hemorrhage after a history of a blow to the eye, indicate possible ocular damage. A shallow anterior chamber in comparison with the other eye points to a probable penetrating injury.

5. Normal vision is compatible with serious eye injuries.

6. Always examine with an ophthalmoscope, employing a high plus lens (plus 12 or plus 15), starting 6 or 8 inches from the patient's eye. Pick up the pupil and the red reflex, and slowly decrease the plus as you approach the pupil and examine the fundus. A corneal scar, foreign body, or lens opacity is seen as a dark spot in the red reflex. If there is vitreous hemorrhage or a large retinal detachment, the normal round, red reflex will be obscured or absent. A large vitreous hemorrhage will cause a black reflex. If fundus examination reveals any abnormality, consultation with an ophthalmologist should be secured. A retinal detachment is usually seen as a gray, elevated area over which the retinal vessels are black, rather than red.

7. An iris which trembles during movement of the eye indicates that the lens is either dislocated or absent.

8. A "black eye" or bleeding from the nose or ears following a head injury may mean cranial damage.

Management

For purposes of discussion, the eye will be divided into its geographic parts.

Orbit.—Injuries to the orbits may involve either soft tissue trauma with bleeding, lacerations of the brow, or fractures of the orbital rim. An important injury is the "Herb Score" type, in which the patient is struck in the region of the orbit with a hard or a soft ball. This will most commonly be seen in adults who play rarely and who have not learned that men should not play boys' games. The orbital rim will usually cushion a blow against the eye unless the offending object hits the relatively unprotected temporal side. A soft ball, with its larger circumference, is more apt to cause bony injury than a hard ball.

Emphysema and crepitation on palpation should lead one to suspect fracture of the orbital rim, and demand an x-ray examination. When a fracture of the floor of the orbit is not promptly corrected, the eye ball will drop and severe diplopia will result. Simple, uncomplicated lacerations of the orbital skin are sutured in routine fashion.

Sudden loss of vision accompanying an injury to the globe may mean fracture of the orbit resulting in laceration of the optic nerve or hemorrhage into the nerve sheath.

Blows to the lids most commonly cause ecchymosis, the common black and blue eye. This rapidly responds to daily intramuscular injections of 1.0 cc. of trypsin. The injection of 20 units of hyaluronidase into the discolored area will stimulate more rapid absorption of the blood. This is inadvisable, however, in aged and debilitated individuals, as it may produce more bleeding.

Simple lacerations of the skin may be closed with a 5-0 or 6-0 silk sutures. If the laceration is through the lash margin of the lid, one must approximate the cut distal edges, otherwise lid notching will occur. When the laceration is deep, the lid must be closed in layers. If the laceration extends though the conjunctiva, the cut ends of the sutures should be buried within the lid, otherwise they will abrade the cornea. If the laceration is between the punctum and the nose, one should ascertain if the lacrimal canaliculus is severed, as this calls for specialized care. If an ophthalmologist is not available, the physician should attempt to push a fine wire, polyethylene tubing, or stiff catgut suture through the punctum and then out the cut end of the canaliculus and into its other cut end as far as possible. Because of its delicacy, loss of any appreciable amount of lid skin demands plastic surgery to prevent lid distortion with eversion of the lash margins and consequent tearing and discomfort, or inversion of the lash margins with resultant denuding and scarring of the cornea. Partially severed ocular tissues which hang down, as, for example, the edge of an eyelid with its lashes, and are almost completely separated from the rest of the lid, will often retake with amazing rapidity. One should not do extensive debridement or excise such dangling tissue areas unless he is sure of his ground.

Conjunctiva and Cornea.—Small lacerations of the conjunctiva need not be sutured. Any laceration of the conjunctiva means that a penetrating injury must be ruled out. Chemicals which enter the conjunctival sac must be removed immediately by copious irrigation. Solid chemical particles which remain must be removed with fine forceps. This is especially true of lime and plaster. One should thoroughly irrigate the area of the upper cul de sac. Corneal and conjunctival injuries are similar when chemicals are involved. Acids tend to cause immediate, usually localized, non-progressive tissue necrosis. Alkali burns, such as those due to plaster and lime, are dangerous and progressive, especially if any residual particles are not removed. At this point, it must be emphasized that neutralization of chemicals is passe. One no longer waits to neutralize a chemical, but washes it out as rapidly as possible. The patient's eye should be irrigated promptly at the work site with water from a pan, bucket, hose or any other handy source of supply, or his head should be held

in a bucket of water, or under a running tap with the lids forcibly held open.

Corneal burns heal more rapidly under the influence of topical steroids. Chemical gases may penetrate the cornea and enter the globe, necessitating paracentesis of the anterior chamber. This procedure demands the attention of an ophthalmologist. The danger of this type of injury should be borne in mind.

When chemicals enter the cul de sac, they may create adhesions between the abraded conjunctiva and the cornea. These should be prevented by: (1) instilling bland ointments between the lids, (2) avoiding complete immobilization of the eye for long periods, and (3) by putting a shape-retaining conformer made of dental wax or some similar material into the cul de sac if the burn is severe.

Occasionally, contaminated foreign material in the cul de sac will result in an internal (meibomianitis) or external (hordeolum) sty after several days.

It is the physician's aim to control pain, remove foreign substances, stimulate healing, or at least not interfere with it, prevent anatomic distortions, and produce maximal visual recovery. To that end, topical anesthesia is used when the patient is first seen, but as infrequently as possible thereafter. It is better to give the patient some holocaine and epinephrine ointment to be used sparingly at night rather than to have him awaken you because of pain. Where intense lid spasm is present, the anesthetic will enable the patient to open his own eyes and to co-operate with the physician. Topical anesthetics tend to delay healing and should therefore be used sparingly. Antibiotic ointments also tend to interfere with healing and should be used only if infection is present or feared. One should never put any medication into the eye just for the sake of doing something. Topical steroids are not indicated after the removal of simple corneal foreign bodies and may be deleterious in the event that herpes simplex virus is present. In keratitis following reaction to incomplete rust ring removal, steroids minimize reactions. Contamination in the physician's office may result in infection of the wound and possible loss of the eye. One should use sterile solutions and instruments. This means that one should not have his solutions made up by the druggist, but should buy already prepared sterile products.

Metallic foreign bodies are usually associated with rust rings. The foreign body can be lifted out with the tip of a sterile cataract knife, a corneal spud, or a hypodermic needle, using focal illumination and magnification. If the foreign body is deep in the cornea, it should be removed by an ophthalmologist. Do not mistake an iris freckle for a corneal foreign body. The eye should be patched after a corneal foreign body has been removed.

Removal of rust rings is difficult and usually requires the use of a slit lamp. At times, one can touch the area of the rust ring gently with 1 per cent silver nitrate on the tip of a tightly wrapped applicator. The eye should then be patched for 24 hours. The next day the whole area can usually be lifted out with the sharply pointed end of a narrow knife or a needle. It is not advisable, however, for a nonophthalmologist to employ silver nitrate on the cornea and this procedure should not be attempted except in emergency situations.

Occasionally, one will see a large number of foreign bodies in a cornea. When it is evident that attempted removal of these foreign bodies, especially in the pupillary area, might result in considerable corneal scarring and consequent loss of vision, it may be wise to wait and to allow the foreign bodies to extrude themselves. This advice does not apply, however, to metallic foreign bodies, since these should always be removed as promptly as possible. I have seen two cases in which the corneas were spattered with hundreds of foreign bodies as a result of backfire during target practice. In both cases, the foreign bodies extruded spontaneously over a period of months. Attempts at removal would have resulted in considerable visual loss, as a result of corneal scarring caused by the instrumentation.

If a protruding foreign body has penetrated through the cornea into the anterior chamber, it is best not to attempt removal, but to refer the case immediately to an ophthalmologist. Frequently, attempts to remove these protruding foreign bodies result in breaking them off, thus rendering later removal difficult.

Corneal abrasions rarely require more than a cleansing irrigation and a tight pressure patch for 24 to 48 hours. A double eye pad should be affixed with multiple strips of firmly placed adhesive tape to produce the desired pressure immobilization of the abraded globe.

When the attending physician cannot handle a

corneal injury or estimate its gravity, the eye should be patched and thus immobilized until more expert attention can be secured. If the injury is a penetrating one, both eyes should be patched. Corneal lacerations may require suturing. Impact or lacerating injuries to the cornea demand ophthalmoscopic examination to rule out hemorrhage, retinal edema, or detachment. Blows to the eyes may produce ruptures of the choroid which are seen as semilunar, white rings concentric and usually temporal to the optic nerve. Traumatic anterior chamber hemorrhages tend to be recurrent and may produce secondary glaucoma.

Penetrating wounds of the cornea are always potentially dangerous, especially if they have perforated the lens or iris. One should note the depth of the anterior chamber by comparing it to the other eye. If a pupil is irregular or protrudes through the laceration, an ophthalmologist should be consulted immediately. One should avoid the error of trying to wipe a blood clot away from a wound only to discover that it is a prolapsed iris. If the services of an ophthalmologist are not available when the iris is prolapsed, the prolapsed portion should be excised with sterile scissors, after which a cycloplegic such as atropine should be instilled.

Deep injuries of the cornea and iris are accompanied by iritis.

Burns

Flash burns and ultraviolet radiation burns of the cornea rarely cause any serious problem except for the initial discomfort and lid spasm which may last several days. Burns due to boiling water, flames, or hot grease which have not caused serious corneal damage also belong in this category. A drop of topical anesthetic should be immediately instilled into the eye of the victim to show him that he can open his lids and that he has not been blinded. Such burns are best treated with cold compresses, holocaine and epinephrine ointment several times a day for the first few days, and a decongestant (ocular vyzine, ocular privine, phenylephrine ⅛ per cent) two or three times a day, and ample reassurance. Lid burns are treated in the same manner as skin burns elsewhere.

In these days of potential atomic warfare, it is advisable for the physician to know something about ocular injuries during atomic attack. Byrnes[1] and his co-workers have shown that it is possible for an eye which is facing in the direction of the exploding weapon to suffer injury when it is as far as 45 miles away from the blast. While the eye represents a relatively small portion of the total body area, its injury rate may be out of all proportion to its size. External eye burns due to atomic radiation are very much like burns from other causes. The one difference is that because the blink reflex is much slower than the speed of the light delivered by the atomic flash, the inside of the eyeball may be burned before the blink reflex can close the lids. The atomic energy which is delivered to the inner eye through the open pupil results in a choroidal burn. This is permanently damaging and very little can be done for it. At the time of the burn, there is considerable edema of the surrounding retina and choroid. It is probable that the immediate systemic administration of a large dose of ACTH or of one of the steroids would prevent much of the damage due to the edema itself. The size of the pupil controls the amount of damage suffered by the inner eye. All other things being equal, including the distance from the exploding atomic weapon, if the damage takes place in the daytime when the pupil is normally narrower, less light intensity is delivered to the inside of the globe. If the explosion occurs at night when the pupil is normally dilated, the damage is likely to be much more severe. The moral, then, is to avoid being anywhere near an exploding atomic weapon. But, if you are and you cannot get to a safe place, arrange to be exposed in the daytime and to face in a direction opposite than from which the blast comes and to keep your eyes closed. One is apt to be lulled into false security by being many miles away from the explosion. As Byrnes has shown, this security becomes less with each increase in potency of atomic weapons.

Conclusion and Summary

The various ocular traumata which the nonophthalmologist is commonly apt to encounter have been discussed, together with their management. In the main, this is one field where prevention through safety measures and prompt attention to rational first aid is often worth more than later attempts at cure.

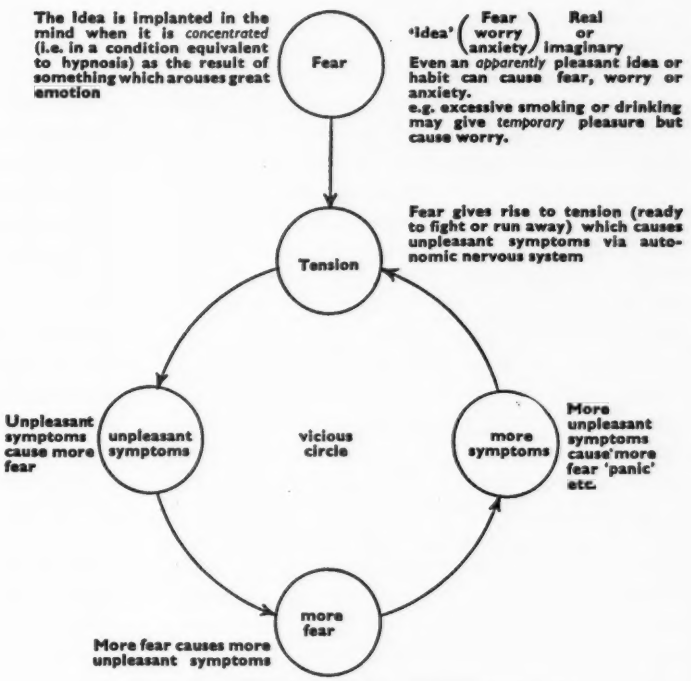
Reference

1. Byrnes, V. A., Brown, D. V. L., Rose, H. W., and Cibis, P. A.: Chorioretinal lesions due to thermal radiation. A.M.A. Arch. Ophth., 56:909 (June) 1956.

Hypnosis in General Practice

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The Mechanism of Neurosis



Some typical nervous symptoms

'pressure' in head	bladder
migraine	bowel } disorders
headaches	sexual } disorders
'full' or 'tight' feelings	menstrual } disorders
vertigo	tension etc.
trembling	'panic' feelings
sweatings	lack of concentration
blushing	(due to preoccupation
'flushes'	with own feelings)
palpitation	failing memory
breathlessness	(results from preoccupation
'sinking' feelings	with self and lack of attention)

From Van Pelt, S. J.: Medical Hypnosis Handbook, courtesy of Wilshire Book Company, Los Angeles, California.

MILTON[1] once wrote: "The mind is its own place, and in itself can make a Heaven of Hell, a Hell of Heaven." Probaby no two lines could express more fully the problem of neurosis in medicine, for in the neurotic it is the working of the mind and the imagination, combined with fear and anxiety, that creates the symptoms and signs which make life one continual torment of suffering.

All of us in practice are confronted daily by the person, who, in spite of multiple or systematic complaints, fails to present a pathological picture that can be interpreted as organic. Lewis,[2] at Johns Hopkins Hospital, in a report of 163 care-

fully studied consecutive patients, found 49 per cent had only psychogenic disorders and 27 per cent represented a combination of psychic and somatic processes. Thus 76 per cent of the patients were suffering wholly or in part from emotionally determined disease. The medical problems were predominantly chronic in nature and usually not severe enough to require hospital care but sufficiently severe to warrant some medical attention. In the average general practitioner's practice, this percentage will follow very closely. If one eliminates the common infectious processes, it will be found that approximately 60 per cent to 70 per cent of all patients seen have psychogenic illness, either pure or admixed with certain organic factors. What therapy have we for these patients?

John Schindler[3] once stated, "Our therapy for neurosis is no better today than it was 3000 years ago." In spite of the numerous and varied tranquilizers and sedatives, the neurotic still continues to plague us almost daily with his irrational and sometimes illogical symptoms.

In a study by Weiss and English[4] of the so-called "thick chart" patients (i.e., patients from the outpatient department selected solely on the basis of having a chart an inch or more thick) they coined a new phrase to replace "the high cost of psychiatry;" it was "the high cost of no psychiatry." Patients who accumulated these thick charts often had made dozens of visits with numerous referrals to specialty clinics involving hundreds of dollars worth of laboratory work and x-rays, innumerable prescriptions for placebos and barbiturates, and often, unnecessary surgery as well. Their illness frequently could have been better understood by an hour's interview conducted along psychosomatic lines.

In the evolution of the study of psychiatric health, Freud, of course, deserves credit for the great initial stride. His concept of the continual battle between the id, the ego, the super-ego and the environment, which is the basis of all neurotic illness, is familiar to us all. In 1885, Freud[5] began the use of hypnosis but soon abandoned it because of his inability to hypnotize most patients into a deep enough state to make analysis feasible. His attitude toward hypnosis was one of avoidance rather than outright rejection. His honest and open admission of confusion and ambivalence with regard to hypnosis is to his credit as a scientist.[6] All of Freud's pupils continually felt that psychoanalysis was too long, too detailed, and too expensive for the average individual and that shorter techniques of psychotherapy were indicated. Meyer's School of Psychobiologic Therapy has shortened psychotherapy and psychoanalysis immensely. However, this requires a fully coordinated and systematic review of the patient's entire biologic, psychic, and physical systems and is still too long and too expensive for the average individual. Now then, what other techniques do we have?

Van Pelt[7] in England, has put forth a theory of neurosis which is based on fear—either real or imaginary, which if implanted in the mind, concentrated with emotion, invariably gives rise to a tension state. Tension, of course, gives rise to symptoms on the basis of autonomic stimulation. The symptoms cause additional unpleasant sensations and worry which in turn causes more fear. This cycle is repeated over and over again. The original fear may have long ago been forgotten but the symptoms are promulgated by the constant vicious cycle of tension and fear. For example, fear may cause palpitation which in turn may give rise to further fear on the basis of a suspicion of heart disease. This latter fear gives rise to additional tension, which, of course, reactivates the palpitation. Symptoms of palpitation and subsequent insomnia may in turn give rise to increased fear and anxiety which only aggravate the symptoms so that a vicious cycle is established. On the basis of this one cycle alone, all of the various findings which could be symptomatic of neurosis can be found. (See diagram).

Selye,[8] in his study of adaptation and stress, has noted the fact that emotional turmoil gives rise to the most prolonged form of stress reaction of almost any illness. In emotion, the constant tension and fear continue to stimulate the pituitary-adrenocortical reaction which continues to produce the signs and symptoms of stress and alarm reaction. Within the past several years, studies have been done which are beginning to point to the fact that asthma, rheumatoid arthritis, and rheumatoid diseases, habitual abortion in women, and other of the so-called stress diseases may fall, at least in part, in the psychosomatic realm. Considerably more research will, of necessity, have to be done before any conclusions can be drawn.

Estabrooks[9] has advanced another theory in which he believes that mental disease is basically due to repression, which is in reality, a post-hypnotic suggestion given on the basis of auto-hypnosis or auto-suggestion. This complex is imposed

by life itself—is not under any kind of control, and probably dates back to an early age. The psychiatrist in dealing with the patient is confronted with a post-hypnotic suggestion to be sure, but it is a very different post-hypnotic suggestion from that which he could produce in his laboratory merely to demonstrate a point. He can guarantee to remove his laboratory post-hypnotic suggestion at a moment's notice with no harm done. He can make no such guarantee in the case of the Freudian complex. The two characteristics of the Freudian complex, namely, emotional conflict and time duration, cause the personality to erect extreme resistances to any change. Therefore, how do we treat these emotional illnesses? The basic concept is simple. The best way, as we well know, to rob a post-hypnotic suggestion of its compulsive power, is to bring it into consciousness. This puts an end to the process of unconscious motivation, for the complex in the post-hypnotic suggestion is now a part of our normal conscious life. However, the techniques involved are extremely difficult and occasionally impossible.

If one reviews the cycle as set up by Van Pelt, it is obvious that, analytically, in order to remove all of the tension it becomes necessary to go back and remove the basic fear. Van Pelt[7] has shown that by hypnotic recall, it is frequently possible to bring the original precipitating fear back into consciousness. This serves to remove the unconscious motivation producing the patient's symptoms. A thorough discussion and reintegration of these experiences into consciousness in many instances will result in an amelioration or complete disappearance of symptoms.

For the most part, the use of hypnosis in medical practice will be limited to the treatment of disorders in which symptoms play minor defensive roles. In treating patients under hypnosis we attempt to use the same type of procedures we would use in the waking state of psychotherapy, namely, reassurance, re-education, persuasion, direct symptom removal, treatment through psychobiologic techniques, and lastly, reconstructive therapy, or therapy directed at reconstructing the entire personality, which would be based on deep hypno-analytic techniques. For the most part, for our use in general practice, we will confine ourselves to symptom removal, symptom amelioration, symptom displacement, re-education, persuasion and reassurance. Using these techniques alone, fully 60 per cent to 70 per cent of all neurotic illness will improve under direct hypnotic suggestion. Erickson[12-17] has written extensively on these techniques and reference to his methods are invaluable to anyone employing hypnotherapy.

One criticism which many have to the hypnotic removal of symptoms is that it attempts to remove the symptoms without getting at the basic underlying cause of the illness and that therefore, it removes the symptoms but leaves the neurotic personality intact. However, in actuality, it seems that the very persons who would decry such symptom removal are the same men who would prescribe ergotamine for migraine, barbiturates for tension headache, corticosteroids for asthma, antispasmodics and antacids for gastric neurosis, et cetera, without attempting to get at the underlying psychological conflict. What difference is it then, if we can remove tension headaches by teaching a process of relaxation rather than by giving repeated doses of a barbiturate?

The list of conditions in which hypnosis may be used is legion. It may be used both in the treatment of functional and organic disease, and anyone interested in its use in general medical patients is referred to the works of Bernheim[10] and Bramwell[11] who used it successfully in almost every syndrome reported. For our own use and for our description, we are going to take just a few conditions and state briefly some of the results which have been attained and list certain cases which demonstrate its effectiveness.

Psychoneurosis

Probably nowhere has hypnosis been more extensively used than in the treatment of the psychoneuroses and their attendant somatic symptomatology. Its use in these syndromes is either in the form of authoritative direct symptom removal, which has in many instances given remarkable and prolonged results, or in combination with persuasion, re-education, reassurance and other simple psycho-therapeutic techniques. The following cases illustrate some of the techniques which have been used.

Case 1. Mrs. W., a thirty-two-year-old housewife, has suffered for the past four and one half years from moderate insomnia, extreme nervousness, spells of extreme jitteriness, general bodily discomfort, occasional headaches, heartburn and numerous attacks of palpitation numbering up to ten to twelve daily. These were accompanied by anterior chest pain, dyspnea and a general feeling of nervousness. She had been studied repeatedly for organic illness and none had been found. Her thera-

pies had been numerous and varied without significant response. The patient stated that her symptoms began when her child developed diabetes. At that time she became nervous, apprehensive and fearful. Physical examination at the time of her first examination was entirely negative other than showing the findings of apprehension, precordial tenderness and sweaty palms. The patient complained subjectively of pain in her chest and her right shoulder. Under a guise of relaxation, the patient was hypnotized and achieved a deep trance in less than two minutes. Her symptoms were explained to her as a reaction to fear over her child and that in view of the fact that her child was considerably better now she no longer needed them. The patient was then allowed to sleep for ten minutes and awakened. She awakened without the pain in her chest or her shoulder, stated that she was sorry that she had fallen asleep and was discharged. She was seen ten days later at which time she had had two minor episodes of palpitation but had otherwise felt extremely well. She has been followed over the past eight months and is at present asymptomatic except for very slight fullness in her throat when under stress.

Case 2. This patient is a twenty-two-year-old woman who has had recurrent right lower quadrant pain for approximately six years. The pain was almost continuous in nature although periodically would increase to a point where she would have difficulty in walking. She had been advised by three physicians to have an appendectomy. During a period of two years while the patient was under my care, she complained of pain recurrently every four to five weeks. Physical examination, laboratory studies and x-ray examination were all entirely negative and the patient's response to all therapeutic regimens was poor. The patient was hypnotized with her consent and asked to recall the first time that she had this pain. She stated that she was thirteen, that she had gone out with a boy who was considerably older than her and that her father had suspected her of sexual indiscretion and had taken her to a doctor. Following this, she stated the pain occurred, lasted a short time and then subsided. However, at the age of sixteen she became pregnant illegitimately and had a spontaneous abortion after a toboggan accident. It was shortly after this that her pain became more intense. She suffered severe feelings of guilt and anxiety over the pregnancy and abortion and stated that she felt that this pain was her punishment.

Although no further attempts were made to explain the underlying psychodynamics or to elicit other dynamics of her illness, the pain subsided within twenty-four hours after hypnotic therapy and the patient has been entirely free of any discomfort over the past eight months.

Case 3. The patient is a twenty-six-year-old man who first consulted me because of periodic indigestion, upper abdominal pain after eating and a burning feeling in the epigastrium of approximately six months' duration. It was becoming progressively worse. The patient was now suffering from large amounts of gas, belching, insomnia, but did not complain of overt nervousness. Physical examination revealed epigastric tenderness but was otherwise essentially negative. No radiologic examination was done. Inquiry into emotional factors which may have been responsible for the pain were entirely without avail. The patient was placed on an ulcer routine and observed over a two-week period. He noticed slight improvement but the symptoms and insomnia persisted.

Under a guise of relaxation, the patient was hypnotized but only a light trance achieved. A single statement was made to the patient as follows: "Perhaps there is something that is bothering you that you have not entirely been aware of or that you haven't told me which might be responsible for your symptoms." Without awakening, the patient immediately poured out a tirade of resentment and hostility toward his employer and the people with whom he worked feeling very resentful of the fact that he deserved more financial remuneration for what he was doing. His job carried considerable responsibility without commensurate financial compensation. During a period of twenty-five minutes, the patient gave vent to his feelings of indignation. Following this, an explanation of the dynamics of the conversion of his resentment into symptoms (utilizing ordinary organ language comparisons) was given in both the hypnotic and subsequently on the waking level. In spite of no suggestions as to his continuing therapy, the patient stopped the medication and the following day went back to his normal diet and has been asymptomatic for the past six months.

It is readily apparent to anyone familiar with the psychodynamics of emotional illness and with psychoanalysis that the above interpretations and explanation of illness are on an extremely superficial level. However, it has been surprising to me that the results, using even superficial analytic types of interpretations as those noted above, have been very successful in removing a large number of psychosomatic symptoms without re-precipitating other new and different symptoms, and that the need for deep analysis has been unnecessary in most of the patients seen.

Epileptoid Seizures

The question of whether epilepsy or atypical epilepsy can represent psychogenic illness has become apparent within recent years. Numerous reports have appeared in the literature in which atypical epileptic seizures have been relieved or considerably ameliorated by hypnosis or psychotherapy.[18-20] Rosen[21] has reported a case of a woman with severe epileptic seizures of Jacksonian type, who had two cranial explorations because of her symptomatology. Her entire picture was based on psychogenic causes and was relieved by hypnotic therapy. The following case demonstrates

an atypical epileptic picture which responded almost dramatically to hypnosis.

Case 4. A. H., a seven-year-old boy, when seen had had seizures over a period of approximately nine to ten months during which time he would become incoherent and scream and act rather wild. The child would occasionally fall in a fit and would sometimes run into objects as if he did not see them. There appeared to be momentary lapses of consciousness. The spells had become progressively worse and more numerous. He complained of some headaches over the occipital area of the skull.

Physical examination, neurologic examination, routine laboratory and x-ray studies were entirely negative. Neurologic consultation substantiated a diagnosis of possible petit mal seizures with psychomotor varient. An electroencephalogram was reported as diffusely abnormal but non-localizing. All other studies were entirely negative.

The patient was hospitalized and during three days of hospitalization had no seizures although he would become somewhat hyperkinetic before visiting hours. He was hypnotized on two occasions and seizures were precipitated under hypnosis. He was then asked to define the feeling which he really had. He stated that he was angry at his father and mother for the way they treated him. It was obvious from conversation that there were deep underlying hostile feelings toward his parents who had totally rejected him. Under hypnosis, an explanation of his feelings was given to the child in language that he could understand and it was suggested that perhaps his problems could be resolved in a somewhat more satisfactory manner than in the manner in which he was attempting to solve them. He was told that he could find other less frightening ways of expressing his hostility. No further therapy was done and yet the child has remained entirely free of seizures, has been considerably less nervous and has improved remarkably in school over the past two years.

Two other patients with atypical epileptic seizures, both of whom had been under the care of neurologists, have been treated over the past six months. Both have been found, on analysis, to represent a discharge of underlying feelings in the form of "acting out" and both have responded dramatically to a rather superficial insight therapeutic regime."

Musculo-Fascial Syndromes

Over the past several months, hypnosis has been used in the treatment of eight cases of lower back pain, bursitis, mild fasciitis, all of which failed to respond to ordinary conservative methods of therapy for periods of up to eight weeks. No case was treated with hypnosis which had not had at least ten to fourteen days of ordinary conservative therapy. In this it was hoped that the patient would serve as his own control for the results. In most cases the symptoms were becoming progressively worse rather than better at the time that hypnosis was first attempted.

After hypnotic therapy was begun, improvement was noted within twenty-four to forty-eight hours in almost every case and this improvement was progressive.

Case 5. The patient is a thirty-five-year-old woman who had had a backache of nine and one half years' duration which had begun shortly after the birth of her second child. She had been treated by eight different doctors during that period of time and a multitude of therapeutic techniques had been used, all without success.

Utilizing hypno-analytic techniques, it was found that the patient's backache represented a tremendous amount of self-directed hostility which because of rigid personality factors could not be directed into other more normal channels. Following the development of rather superficial insight into the reason for her backache, the patient's pain cleared spontaneously and she has been free of discomfort for the past seven months.

In most other cases no analysis of underlying emotional factors was undertaken and the only suggestions given were that there would be a progressive increase in relaxation with a corresponding diminution of the amount of discomfort until the discomfort would cease to exist altogether. The patient's response to therapy in all cases was rather remarkable, the improvement being progressive and complete in every case.

Surgery

Hypnosis has been used in the preoperative preparation of the patient for surgery, both to relieve the anxiety caused by the anticipation of surgery, and for the purpose of relieving part of the postoperative discomfort. In a separate study done by the author and co-workers[22] at the University of Minnesota, it was found that preoperative hypnosis and suggestions of comfort after surgery resulted in 55 per cent lessening of the amount of narcosis required. Perhaps a better view is obtained when six consecutive patients having had a cholecystectomy are cited. Of these, two control patients received eight and eleven doses of narcotics postoperatively, while four hypnosis patients received none, one, two, and four doses, respectively.

In my own practice, hypnosis has been used as an adjunct to surgical therapy in numerous pa-

tients. In adult patients undergoing tonsillectomy under local anesthesia, it has been found that by hypnotic augmentation of anesthesia, bleeding has been controlled in almost every case, and post-operative discomfort has been minimal to entirely non-existent. A traumatic laceration of the ulnar nerve was repaired under hypnotic anesthesia, alone, in an apprehensive young woman sixteen years of age. Another young girl, who had sustained a complete severance of the flexor tendons of the left fifth finger, underwent the entire operative procedure of tendon repair using a minimal amount of local anesthesia and hypnotic relaxation. In one patient who desired hypnosis as the sole anesthetic during surgery for a thyroid adenoma, hypnotic anesthesia was attempted but could not be obtained even after five hours of intensive hypnotic training. The patient was advised, however, that although her hypnotic anesthesia could not be used for the surgery itself that it would be effective in the postoperative phase. Therefore, she had the thyroid adenoma removed under pentothal anesthesia with strong preoperative suggestions that she would have no postoperative pain. Following surgery, the patient was awake within one hour, within two hours had eaten a full meal, had absolutely no discomfort during her postoperative period in spite of a minor wound infection, and was discharged from the hospital entirely asymptomatic three days after surgery.

A major factor in the preoperative use of hypnosis is the fact that although the relative amount of narcosis in any individual case may not be substantially altered, the patient will, nevertheless, readily admit that he feels considerably better than he had anticipated. In several cases, a good evaluation has been possible where the same patient has had preoperative hypnosis for one operation and has had other surgery done without hypnosis. In these particular cases, the comments of the patients were extremely rewarding.

Obstetrics

The use of hypnosis in the preparation for delivery has, within recent years, greatly increased in popularity notably through the efforts of Kroger and DeLee,[23] Abramson and Heron,[24] and Clark,[25] who by their reports of its success have prompted others to use it. Its effectiveness in this field is measured primarily by its ability to diminish the amount of analgesia and narcosis during obstetrical labor and delivery; by the moderate to marked shortening of labor; and the increased sense of comfort to the patient. In occasional instances, with a good hypnotic subject, spectacular results will be reported. However, in the vast majority, although discomfort persists, the patient becomes able to tolerate it and to remain rather placid during delivery, requiring much less narcotics than the non-hypnotized subject.

In my own practice, teaching has been given to the patients as a group which meets every other week for approximately two hours. During these sessions, the patient is trained in the development of the hypnotic and auto-hypnotic state, using a technique modified from that of Clark. Suggestions are given for a diminished amount of fear, for increased sense of relaxation during labor and delivery, and for a relative amount of analgesia and anesthesia. Patients are trained in the technique for inducing an auto-hypnotic state, to be used at their own discretion, during labor. It must be understood that group hypnosis will in no way achieve the results that can be obtained with intensive individual instruction. However, the time which one can devote to this type of training is markedly limited in a busy general practice and one must be willing to settle for somewhat less than optimal results.

Hypnosis has been used to date in a total of fifty-three patients and its results are summarized in Table I along with a control group of fifty-five patients. No attempt was made to separate the first and second stages of labor in these patients and both stages are grouped in the total time. In the report published by Abramson and Heron[24] it was noted that, in both the trained and the untrained subjects, the second stage comprised 35.8 minutes and 34.8 minutes, respectively, so that the second stage of labor has shown relatively little difference in the trained and the untrained patients. The longest labor in the hypnotic group was twenty-three hours. In the untrained group,

TABLE I. RESULTS OF HYPNOSIS IN LABOR

	No. of Patients	Mean Duration of Labor (1st & 2nd stage)	Mean Amount Demerol Per Patient
Primipara			
(Hypnosis)	18	9.9 hours	73.3 mg.
(No hypnosis)	13	16.2 hours	91.1 mg.
Multipara			
(Hypnosis)	35	5.65 hours	23.6 mg.
(No hypnosis)	42	7.07 hours	62.0 mg.

there were two labors of slightly over thirty-eight hours.

It is interesting to note that in the thirty-five multipara who delivered under hypnosis, twenty-five took no analgesia at all; whereas, in the control group of forty-two patients only eleven were able to go through labor and delivery without analgesia.

The testimony and comments of the individual patient have probably done more to increase the popularity of hypnosis in my own particular practice than any other factor. These patients have, for the most part, been extremely grateful and have felt that hypnosis has not only helped them with their labor but this increased training in relaxation has helped them with their subsequent tensions and anxieties.

Summary

Although the use of hypnosis in medical therapy may still be considered in its infancy, nevertheless, the results obtained cannot be denied. Although not advised as a panacea, it is felt that its use as an adjunct to orthodox medical therapy will result in improvement of the entire therapeutic regimen. As with other modalities of therapy, discretion must be exercised at all times and patients picked with considerable care. It is only by such measures of approach that hypnosis will prove its worth as a medical tool and will not again be relegated to oblivion as has so frequently happened in past centuries.

References

1. Milton, John: Paradise Lost, Part I. New York: Viking Portable Library.
2. Lewis, B. I.: Psychosomatic disorders and nonpsychiatrist. J.A.M.A., 150:776, 1952.
3. Schindler, J.: Talk before Minnesota Academy of General Practice, St. Paul, 1956.
4. Weiss, E., and English, O. S.: Psychosomatic Medicine. Philadelphia: W. B. Saunders & Co., 1957.
5. Freud, S., and Bruer, J.: Studies in Hysteria. New York: Nervous and Mental Disease Publishing Co., 1936 (Pub. in Germany 1895).
6. Kline, M. V.: Freud and Hypnosis. New York: Julian Press, 1958.
7. Van Pelt, S. J.: Hypnotism and the Power Within. New York: Wehman Bros., 1954.
8. Selye, H., and Fortier, C.: Adaptive reaction to stress. Psychosom. Med., 12:149, 1950.
9. Estabrooks, G. H.: Hypnotism. New York: E. P. Dutton & Co., 1957.
10. Bernheim, H.: Suggestive Therapeutics. New York: G. P. Putnam and Sons, 1899.
11. Bramwell, J. M.: Hypnotism, History, Practice and Theory. New York: Julian Press, 1903.
12. Erickson, M. H.: Investigation of a specific amnesia. Brit. J. M. Psychiatry, 13 (pt. 2):143, 1933.
13. Erickson, M. H.: Experimental demonstration of psychopathology of everyday life. Psychoanalyt. Quart., 8:338, 1939.
14. Erickson, M. H., and Erickson, E. M.: Concerning nature and character of post-hypnotic behavior. J. Gen. Psychol., 24:95, 1941.
15. Erickson, M. H.: Hypnotic investigation of psychomatic phenomena. Psychosom. Med., 5:51, 1943.
16. Erickson, M. H.: Hypnosis in medicine. M. Clin. North America, 28:639, 1944.
17. Erickson, M. H.: Hypnotic psychotherapy. M. Clin. North America, 32:571, 1948.
18. Lennox, W. G.: Science and Seizures. New York: Harper & Bros., 1941.
19. Mittleman, B.: Psychopathology of epilepsy. In Hoch, P. H., and Knight, R. P.: Epilepsy—Psychiatric Aspects of Convulsive Disorders. Proc. Am. Psycho-Pathol. A., 36th meeting, New York City, May, 1946. P. 136. New York: Grune and Stratton, 1947.
20. Greenacre, P.: General problems of acting out. Psychoanalyt. Quart., 19:455, 1950.
21. Rosen, H.: Hypnotherapy in Clinical Psychiatry. New York: Julian Press, 1953.
22. Griffen, W., Doberneck, R., Papermaster, A., Bonello, F. J., and Wangensteen, O.: Hypnosis as an adjunct to surgery (to be published).
23. Kroger, W. S., and DeLee, S. T.: The use of the hypnoidal state as an amnesic, analgesic and anesthetic agent in obstetrics. Am. J. Obst. & Gynec., 46:655, 1943.
24. Abramson, M., and Heron, W. T.: An objective evaluation of hypnosis in obstetrics. Am. J. Obst. & Gynec., 59:1069, 1950.
25. Cooke, C. E., and VanVogt, A. E.: Hypnotism Handbook. Los Angeles: Griffin Pub. Co., 1956.

Endogenous and Exogenous Materials Used in Repair of Large Hernial Defects

Review of the Literature

● *Repair of a simple uncomplicated hernia, while not necessarily a thing of beauty, may be a procedure of joy to the surgeon. Conversely, attempts to repair large recurrent hernial defects may give rise to the greatest vituperation and perspiration ever heard and seen in the operating room. This is an interesting review of the use of various materials to repair such appalling defects.*

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THE belief that all hernias are curable has kept surgeons searching for the ideal hernia repair, that is, the perfect cure. New technics, new methods and new materials have been described in an endless parade of "reviews" and "series." Yet the subject is never dead. Recurrent hernias, because they represent such an obvious failure to achieve ideal treatment, are a particular challenge. Each operative repair compounds the reparative problem, to say nothing of the patient's misgivings. No challenge in this field is greater than the repair of the extremely large, recurrent hernial defect.

The great majority of herniorrhaphies involve small inguinal hernias. A lesser proportion are repairs of large inguinal hernias and most of the incisional and other ventral hernias. An extremely small number, certainly less than 5 per cent, deal with those massive muscular faults which may be incisional, congenital (usually umbilical or para-umbilical), or the result of previous removal, as in wide excision for cancer, and which are almost always veterans of attempted repair. These few require the additional support of prostheses, or grafts.

This discussion is focused on the various endogenous and exogenous materials used as grafts in the repair of these uncommonly large hernias.

The basic weakness in a hernia is in the fascia and muscle. This extensive loss must be replaced and the abdominal wall must be reconstructed. Redundant tissue is usually present in these great bulges, but it is weak; it is attenuated aponeurosis or merely the stretched scar tissue resulting from a prior operation. When the hiatus between the stronger peripheral layers is more than 8 or 10 cm. in length and when the patient is obese, a patch is necessary to bridge the gap. Herniorrhaphies using relaxing incisions or the turning of fascial flaps, either pedicled or free, may only displace the basic weakness.

Not only is the wall rebuilt, then, but the use of the graft obviates excessive tension in bringing together the strongest remnants of the abdomen.

This in itself is a complex problem. On the one hand, the placing of deep sutures under tension is a violation of a fundamental surgical principle. On the other hand, it is well known that wounds which heal under tension are more resilient, because the fibrous scar aligns itself against the greatest stress. Sutures must share equally the burden of closure. The graft ideally distributes tension evenly, at something less than the critical force, with enough immediate strength to withstand breakdown postoperatively and enough durability to serve as a scaffold on which the body constructs its own directional scar.

Historical Developments

The history of this aspect of surgery is colorful. The old "stone and rupture cutters" were highly original men who wrote extensively and often heatedly extolling their own choice of suture material and technique. Some of the best-known surgeons have cut their teeth on hernias. W. J. Mayo[1] published his radical cure of umbilical hernia by the transverse overlap method, which involved extending the hernial hiatus sharply and then overlapping successive fascial layers much as in buttoning a double-breasted coat. This foresaw the next step in herniology, namely the swinging of re-enforcing fascial flaps. Halsted[2] claimed to have first described this procedure in inguinal herniorrhaphy. He said, "The anterior sheath of the rectus muscle might be employed . . . whenever the conjoined tendon is insufficient. . . ." Incidentally, he gave some credit to his then house officer, Harvey Cushing, for making a sketch of the method.

These innovations opened the door to a new era of surgical reconstruction of the abdominal wall. Billroth reflected the creative thinking of the times in a prophetic statement, which was quoted from Czerny by Halsted[2]: "If we could artificially produce tissues of the density and toughness of fascia and tendon, the secret of the radical cure of hernia would be discovered."

Kirschner,[3] in 1909, showed that autoplastic grafts of fascia lata remained viable when transplanted, and Gallie, in 1930, demonstrated their practical value in ventral herniorrhaphy. Wangensteen,[4] in 1934, and many others since have written convincingly of the use of fascia lata as onlay or, better, inlay grafts. Masson[5] pointed out that strips of this fascia, cut from the iliotibial tract with his stripper, could serve as "living sutures." Dermal and "cutis" grafts were first used in the early 1900's by Loewe,[6] Rehn[7] and others, and were first utilized in this country in the 1930's; these have been only transiently in vogue in the United States, as compared with a more widespread acceptance in Europe and South America.

Metals of all kinds have been tried in reconstructive surgery ever since gold was used in repair of a cleft palate centuries ago. Phelps,[8] in 1894, tried coiled silver wire, and Witzel,[9] in 1900, used ready-made silver mesh in attempting to patch up large hernias. For a time, silver and some other metals were thought to have bactericidal activity in the body, but of course these operations failed. Stainless-steel mesh and chain nets or filigrees were introduced into hernia repair in the late 1930's. Tantalum, suggested by Burke[10] in 1940 as a suitable prosthetic element, became generally available in the United States in 1945. Throckmorton,[11] Koontz,[12] and Lam and associates[13] published encouraging preliminary reports in 1948. Finally, the use of synthetic materials, including nylon, teflon, dacron (or mersilene), ivalon sponge, silicone products and others is being reported now at an almost feverish rate.

The Ideal Material for Repair

Obviously, the ideal graft is first of all functional. The graft is a "patch" only insofar as it becomes a functioning part of the body. Other good qualities, such as availability, ease of sterilization and cost are secondary. Naturally, no list is complete in describing the best of all possible graft materials; no one can predict what late unfavorable side effects may arise, nor can one ever define perfection. Cumberland[14] made a workable starting list and is usually quoted on what constitutes a nearly ideal graft for the abdominal wall. He said:

1. The prosthesis must be relatively inert in the tissues. . . .
2. The material used should be easily sterilized.
3. It should be durable and should provide a supporting framework for a sufficiently long time to allow the formation of a firm and stable fibrous tissue matrix to provide a permanent cure of the hernia.
4. The material should be relatively elastic so that it may respond to deforming forces, such as muscle contraction, coughing and sneezing, without tearing of its attachments to the patient's tissues.

5. It is preferable that the borders of the material should be smooth. . . .
6. It should be radio-translucent. . . .
7. The prosthesis should be readily obtainable and economical.

He had good results using a prefabricated nylon prosthesis.

Some excellent experimental work has been done in evaluating the newer materials, such as tracing serially the tensile strength of the repair as the graft is gradually replaced by connective tissue. Attempts have been made to predict disadvantages, such as subsequent weakening of synthetic materials through depolymerization, late calcium deposits, or even potential carcinogenic effects. Since no one yet has adequately compared different materials using the same technique in groups of similar patients, it appears that we must wait for the much slower and less satisfactory type of proof, namely the accumulation of an impressive quantity of successful repairs.

Fascial Grafts

Fascia lata from the patient's own thigh has proved its functional worth in this way. Not only is the graft itself viable but, used in conjunction with inert materials, it becomes a source for the generation of new fibrous tissue. In 1957, Burton[15] stated that the use of generically related tissues, such as fascial grafts, generally gives the most satisfactory results. Against the regular use of such an autograft is the time-consuming and sometimes exacting process of trimming sufficiently large pieces from the thigh. Fascia also has a unidirectional force, which makes it theoretically less desirable in distributing tension and practically more difficult to suture. It is not currently in vogue, especially when compared with the synthetic materials, which have received such dramatic attention recently in vascular surgery. For example, a young surgeon now can safely remark, as Moloney[16] did in 1958, "Most surgeons have stopped damaging the thigh to secure fascia to repair the abdominal wall." It appears that the proved value of fascia lata is currently underestimated.

Heterografts, such as those from ox fascia, had sporadic success and were a nuisance.

Skin Grafts

Dermal and cutis and even full-thickness skin grafts have been used successfully; they actually take a more active part in the body's postoperative regenerative reaction than does fascia. Uihlein,[17] in one of the first articles in English on the subject, in 1939, pointed out the importance of suturing cutis grafts under tension, making a "taut drumhead," in order to provide the optimal functional stimulus to scar formation. However, these grafts are cumbersome to prepare and somewhat difficult to sterilize. In addition, cysts have been reported to originate from buried, skin-derived transplants, presumably arising in the stubbornly persistent sebaceous glands.

Metals

The metals, especially tantalum mesh, for a while appeared to be the most hopeful candidate for the best graft, and they are still in wide use. ReMine and White,[18] in reviewing thirty-one ventral herniorrhaphies at the Mayo Clinic up to 1953 using tantalum, found that 74 per cent of the patients who were followed were well and had no recurrence one to nine years later. The subsequent "work hardening" and late "fractures" of these metallic implants, which are so apparent roentgenologically, originally were thought to be of only academic importance. After all, the long-term results depend not so much on the graft itself as on the fibroblastic replacement of the graft. However, late recurrence has taken place, and the sharp edges of the broken metal have worked themselves deep, even to direct contact with the intestine. In 1956, Hultengren and Lindholm[19] reported incapacitating aching and stinging sensations in a small group of cases in which tantalum was used, but these effects have not been widely noted. As one can appreciate, the removal of any of these meshlike materials, which are only trellises encased in cicatricial concrete, is a heroic task, but it has been necessary when infection or draining sinuses persist.

Synthetics

The materials now receiving the greatest attention are the man-made synthetics and fabrics, such as nylon (used as a monofilamentous net or tricot[20]) and polyester fibers, the trade names of a few of which are Dacron (DuPont) and Mersilene (Ethicon). Surgical ivalon sponge, used in sheets 2 or 3 mm. thick, is easy to work with, presents few problems of fluid collection, and retains good strength after repair.[21] It does not have the readily demonstrable lightness and

strength of the other fabrics, however, which is perhaps more a poor selling point than a disadvantage. Preliminary clinical reports (often too preliminary) on these newer materials are extremely encouraging, but it is impossible from the current literature to evaluate their relative place in the repair of hernias.

Comment

The growing enthusiasm for such apparently ideal grafts is tempered by a lingering scepticism. The very conservative surgeons always have been distrustful of the implantation of foreign bodies. Many surgeons point out that unfavorable operative results do not appear in current publications and that the few reports of positive results have little statistical support and may be premature. Mayo and Keeley[22] suggested a five-year follow-up as a reasonable minimal period for first reporting recurrence rates. Many surgeons are understandably annoyed when they are confronted with the bad results of prosthetic surgery done elsewhere. In 1957, Maier[23] stated, "Sound surgical judgment is still the prime prerequisite of the good surgeon. It is my conviction that its absence has been clearly demonstrated in most of the patients who have come under my care following the use of these various implants, and their indiscriminate use in the repair of hernias should be condemned."

In 1957, Poth[24] discussed a paper on full-thickness skin implants, saying, "It is my impression that all too frequently and without justification, inert materials or free grafts are used to repair tissue defects. It has been my experience that sufficient tissues are available locally to effect adequate repair whether the defect is in the inguinal region or is a ventral hernia. Should it become necessary to use accessory tissue to bridge a defect, I should favor fascia taken from the patient's own thigh."

Therefore, with as little agreement as is evident concerning the repair of simple inguinal hernias, it is not surprising that even more heated controversy exists on the subject of ventral hernias. As knowledgeable a herniologist as McVay[25] was so disenchanted with the cure rate in these difficult cases that in 1956 he wrote, "The obese patient with a large incisional hernia . . . had better keep his hernia, for the second recurrence will undoubtedly be more troublesome than the first."

A Final Word

In closing a brief review of any subject, it is the custom to say that the next few years should add substantially to our knowledge. In this instance, it is difficult to be that hopeful. For one thing, ventral hernia is a disease of neglect on the part of the patient as well as the surgeon, for, as long as we recommend trusses and as long as we persist in making "unphysiologic" incisions and repair them poorly, we (or preferably some distant colleague) will be faced with recurrent and incisional herniation. Prevention is the ultimate answer, of course, and in this regard the control of obesity is of supreme importance. But even when the instance does arise, the basic surgical principles of asepsis, hemostasis and gentle handling with just the right degree of tension are all probably much more important than is the variety of material we may choose, or even exactly how we patch the gross defect. Although the race for the ideal graft and the perfect hernia repair appears to be advanced and dramatic, we are not likely to succeed unless we return to the basic and undramatic precepts that C. H. Mayo[26] referred to when he said, "Carry out the two fundamental surgical requirements: see what you are doing and leave a dry field."

References

1. Mayo, W. J.: Remarks on the radical cure of hernia. Ann. Surg., 29:51-61 (Jan.) 1899.
2. Halsted, W. S.: Surgical Papers. Baltimore: The Johns Hopkins Press, 1924.
3. Kirschner, Martin: Discussion. Verhandl. deutsch. Gesellsch. Chir., 38:281-283, 1909.
4. Wangensteen, O. H.: Repair of recurrent and difficult hernias and other large defects of the abdominal wall employing the iliotibial tract of fascia lata as a pedicled flap. Surg. Gynec. & Obst., 59: 766-780 (Nov.) 1934.
5. Masson, J. C.: The use of living sutures in the repair of abdominal hernias. Minnesota Med., 18: 365-369 (June) 1935.
6. Loewe, Otto: Ueber Hautimplantation an Stelle der freien Faszienplastik. München. med. Wchnschr., 60(pt. 1):1320-1321 (June) 1913.
7. Rehn, E.: Das kutane und subkutane Bindegewebe als plastisches Material. München. med. Wchnschr., 61(pt. 1):118-121 (Jan.) 1914.
8. Phelps, A. M.: A new operation for hernia. New York J. Med., 60:291-296 (Sept. 8) 1894.
9. Witzel, O.: I. Nachtrag zur Mittheilung: Über den Verschluss von Bauchwunden und Bruchpforten durch versenkte Silberdrahtnetze. Zentralbl. Chir., 27:457-458 (Apr.) 1900.
10. Burke, G. L.: The corrosion of metals in tissues; and an introduction to tantalum. Canad. M. A. J., 43:125-128 (Aug.) 1940.

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Present-day Management of Hyperthyroidism

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The introduction of goitrogenic drugs and, later, of radioiodine in the treatment of toxic goiter was held by many to sound the death knell of the surgeon in this field. However, the surgeon is still very much alive.

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FOR a protracted period of time, the surgeon was considered the final authority in the management of toxic goiter following Kocher's ingenious development of the hemostat now known by his name. This aid enabled the surgeon to conduct the patient through thyroidectomy without fatal hemorrhage; consequently, following a more clear-cut understanding of the function of the recurrent laryngeal nerves and the physiology of the parathyroid glands, subtotal thyroidectomy became a standardized procedure that was conducted with variable risk to the patient throughout the civilized world. At first, the extremely toxic patient was sent to the operating room with some misgiving, because thoroughly effective preparatory agents were yet to be discovered. However, following the widespread adoption of iodides for preparation of the patient, the morbidity and mortality rates quickly decreased to a more acceptable level. The only problem from then on was to attempt to select patients who were sufficiently well that the majority of them might be expected to survive operation.

A rude awakening came to the surgical field in 1943, when the use of goitrogenic drugs was introduced as a possible replacement for surgical therapy. It appeared that a great challenge was being issued to the surgeon, in view of the fact that thyroidectomy perhaps would no longer be required. That the various forms of thiouracil and their refinements did not become the ultimate definitive therapeutic agent is obvious to most authorities at present.

Immediately after World War II, yet another dramatic development in the form of radioactive iodine posed a serious threat to the surgeon's formerly important position. It was stated, rather frankly, that surgical intervention no longer had any place in the treatment of toxic goiter. That this situation is not entirely true appears to be the point of departure at the present time. My surgical colleagues and I are still employing subtotal thyroidectomy when the occasion appears proper, and there is every reason to believe that we will continue to do so.

Types of Toxic Goiter

The late Dr. Henry S. Plummer impressed on both the internists and surgeons of the Mayo Clinic the importance of distinguishing between the two main types of hyperthyroidism. The "hypertrophic parenchymatous thyroid," associated with what is known as exophthalmic goiter, remains a distinct entity that has distinguishing characteristics peculiar to itself. The other category is classified as "hyperfunctioning adenomatous goiter." We continue to divide patients with hyperthyroidism into these separate categories.

The two main groups differ widely in some respects and less widely in others. The age groups are frequently greatly divergent. The response to medical measures, whether preoperative or definitive in nature, frequently is extremely different. The possibility of the ultimate development of malignancy in the thyroid gland has variable connotations, and the complications following partially treated or untreated goiters in these two groups can be strikingly different. Aside from the great contrast in the histologic appearance of these two forms of thyroidal disease, we note also a definite difference in the mortality rates, and more will be said about this later.

Disadvantages of Known Therapy

In considering treatment for toxic goiter, perhaps it is best to admit the shortcomings first in order to clarify the atmosphere in attempting to select what we think is the best treatment in any given case. Perhaps first and foremost among the drawbacks of any known therapy is the recurrence

rate of the original state of hyperthyroidism. It is known that use of iodine alone is followed by an extremely high recurrence rate, and we rarely employ it as the sole therapeutic agent. The goitrogenic drugs may be thoroughly effective in perhaps 50 per cent of the patients; however, recurrence of the original symptoms in the remaining 50 per cent of the patients is enough to stimulate search for some other method of treatment. We surgeons admit to at least a 5 per cent rate of recurrence after even a radical subtotal thyroidectomy. Conversely, however, a 95 per cent rate of relatively permanent remissions appears to be a highly satisfactory situation, and perhaps indicates that surgical treatment deserves careful consideration even in 1959.

Myxedema is considered by some authorities to be the logical end point for any form of treatment of the hyperfunctioning thyroid. It is certainly to be preferred to recurrent hyperthyroidism. We think that treatment need not be this cumbersome and that hyperthyroidism can be controlled permanently in a majority of patients without producing myxedema. We must admit to a myxedema rate of 10 to 15 per cent following thyroidectomy, but this condition is relatively easy to treat and has not posed any great concern. Myxedema following the use of goitrogenic drugs and radioiodine is seen in a much greater percentage of patients so treated.

The mortality rate is something that internists frequently look on as strictly for surgical discussion. As this is a surgically minded audience, we may be forgiven for dwelling on it in a little detail. The surgeon always will be quick to point out that any known treatment may have its own mortality rate. Untreated hyperthyroidism can be rapidly fatal. More often, incorrectly treated hyperthyroidism will not be immediately fatal but may well lead to complications beyond which there is no point of return. One must consider, also, the possibility that any nonsurgical treatment elected for a patient may have its own inherent mortality rate, so perhaps the subsequent brief consideration of surgical mortality may not be inappropriate.

Disadvantages of Surgical Treatment

The disadvantages that are peculiar to surgical treatment are few in number but are uppermost in the surgeon's mind. Perhaps first among these, because it is so obvious to the surgeon and his patient alike, is paralysis of the recurrent laryngeal nerve. It is impossible to know with any certainty what the incidence of this complication is at present. The more experienced a surgeon becomes, the more cognizant he is that, even in the most adept and practiced hands, injury to a recurrent laryngeal nerve is always possible. We have developed a method for thyroidectomy that leaves little or no excuse for bilateral permanent paralysis of the recurrent nerve, but we are well aware that an occasional patient still may sustain unilateral permanent palsy. This incidence is less than 1 per cent in our experience.

Permanent tetany is associated only with surgical treatment. Varying degrees of transitory tetany are demonstrated easily if one routinely searches for Chvostek's and Trousseau's signs in the early postoperative days. As long as difficulty with the airway or carpopedal spasm is absent, no particular treatment is required. When tetany is more severe, treatment may be rather complicated; in permanent tetany, therapy is complex, difficult, time-consuming and often extremely expensive. This is a serious complication, one that should not be minimized.

The morality rate following subtotal thyroidectomy is one feature concerning which we can be extremely objective. We have a modern series, with what appear to be significant statistics that will be discussed in a subsequent section of this paper.

Nonsurgical Methods of Treatment

As already mentioned, my associates and I have abandoned use of the goitrogens as definitive therapy in any routine fashion, as these agents have been disappointing. With a 50 per cent failure rate, and with the possibility of toxic reactions always lurking in the background, we have thought that other methods of treatment would be preferable. Although the newer refinements of these agents cause extremely few toxic reactions, agranulocytosis and other serious manifestations are still enough of a possibility to make us more than a little alert. The extreme difficulty of the accurate, periodic and prolonged observation essential for patients receiving these agents, coupled with the great disappointment that the patient experiences when he is finally told that he will have to undergo some other treatment, is enough to direct us into other fields. At this time, we reserve the goitrogens, most commonly in the form of

propylthiouracil, for that small segment of the toxic patients, perhaps 10 to 12 per cent, who are not able to be prepared completely for surgical treatment with iodides alone.

Use of radioiodine is an apparently satisfactory method of treating many of these patients, especially those who have exophthalmic goiter. In fact, it is now routine treatment in many medical centers. It is a comparatively simple technique, although the patient may wonder why the person extending the medicament to him is wearing a lead apron and handing him the glass with metal tongs. The use of radioiodine is a relatively effective and long-lasting treatment in the great majority of cases. However, we have noted occasional recurrence of hyperthyroidism, occasional complete failure of the radioactive element, and a relatively large incidence of myxedema. Surgeons are called on occasionally to carry out radical subtotal thyroidectomy after the patient has had repeated courses of therapeutic radioiodine. Although the basal metabolic rate may have decreased temporarily, and other signs may appear to be favorable, the original situation appears to be redeveloping, so that finally surgical treatment has been the last resort. A few specimens in the tissue files at the clinic represent goiters of this type, which present homogeneous, nondescript, bizarre-looking tissue that certainly would not arouse much suspicion with regard to the possibility of continuing hyperthyroidism. These changes have been wrought by the repeated doses of radioiodine and yet the hyperthyroidism has recurred.

At the present time, we are alert, perhaps overly so, to the dangers of radioactive elements in these therapeutic doses. Since we know what happens to the thyroid gland, we have been concerned about what might be happening to the pituitary, the pancreas, the ovaries, the testes and other endocrine glands. Concern is felt about the ultimate development of malignant tumors in some of these organs, especially the thyroid. Although proved cases of cancer in the human as yet have not been ascribed to such an origin, malignant tumors have been produced experimentally in animals by this method. Everyone is aware that indiscriminate use of roentgen rays in the earlier days of such therapy produced carcinoma of the skin in many persons. We are now alarmed at the frequency of reports of thyroidal carcinoma in persons who received roentgen therapy during childhood because of "status thymicolymphaticus" or who were given radiation for recurrent adenoid and tonsillar disturbances. The great difficulty, of course, is the fact that several generations may have come and gone before the ultimate damage is apparent. Therefore, my associates and I are reserving the use of radioiodine for exophthalmic goiter in older patients, especially those beyond the menopausal years and certainly those beyond the active childbearing years. We also use it in younger patients who are poor surgical risks or in those patients with previous thyroidectomies in whom the technical hazards of yet another thyroidectomy might well predominate, such as a paralyzed vocal cord or permanent tetany. Even though the patient is youthful, it is easy to convince a surgeon that some means other than surgery should be employed if the patient has had a series of thyroidectomies without control of hyperthyroidism.

Our Present Stand in Exophthalmic Goiter

It already was indicated that the factor of mortality rate would have an effect on our reasoning in selecting present-day treatment. Up until 1945, our surgical mortality rate was averaging 0.5 per cent, which was thought to be the irreducible minimum. However, from 1945 through 1957, not a single surgical death occurred in a consecutive series of 1,742 thyroidectomies for exophthalmic goiter. This is considered to be an extremely significant figure.

With only a 5 per cent postoperative recurrence rate, with the quick control of the hyperthyroidism that usually occurs in the early postoperative days, and with such apparently permanent control, we still are of the opinion that the interests of younger patients exhibiting their first bout of hyperthyroidism of this variety are best served by carrying out radical subtotal thyroidectomy. Approximately 90 per cent of these patients can be placed in a satisfactory category with regard to surgical risk after 10 to 14 days of treatment with Lugol's solution alone. For the remainder, who are thought to be nonsuitable risks on such a program, a more prolonged period (perhaps 6 weeks) of treatment with propylthiouracil precedes the surgical treatment.

Adenomatous Goiter With Hyperthyroidism

We are now more convinced than ever before that this type of goiter should be removed surgically. The possibility of carcinoma of the thyroid is no longer controversial; the only argument is the exact incidence of such development. The presence of hyperthyroidism is no guarantee of immunity

against the development of malignant tumors, although we have found that fewer people with toxic adenomatous goiter also have thyroidal carcinoma. Subtotal thyroidectomy in these patients is extremely gratifying to the surgeon. The toxicity is overcome in a matter of days, and the recurrence rate of a true toxic adenomatous goiter is only 0.5 per cent. At the same time, one must be constantly mindful that there is a higher mortality rate among these patients. One is dealing with a much older age group, and the patients exhibit many more of the ills to which the aging body falls heir. The most prominent factor to be overcome is severe cardiac damage; unfortunately, this development is usually insidious, so that the patient may be brought to the hospital with a tremendously enlarged heart, gross irregularity of the pulse, and extreme hydrothorax, ascites and anasarca, thus presenting an obviously serious situation. It is no comfort to the surgeon to find that an adenomatous goiter has been present for many years and has been dismissed much too lightly. Unfortunately, Lugol's solution, the goitrogenic drugs, radioiodine and any other known medicament, while possibly effective to a certain degree, are much less efficient in this type of goiter. Sometimes we use all, or a combination of many, of these agents and still are much concerned about the ability of the patient to survive. By far the best plan is to treat the patient as vigorously as possible, to correct the cardiac decompensation and to check the extremely toxic state, if only momentarily, so that operation then may be done with reduced risk to the patient.

In 1945, again it was thought that an irreducible minimum had been attained, as the hospital mortality rate following subtotal thyroidectomy in this group of patients was 1.1 per cent. However, from that time up through 1957, only seven deaths occurred in a series of 1,252 consecutive thyroidectomies, giving a mortality rate of 0.5 per cent. Six of these seven deaths were the result of frank cardiac failure. The patients were known to be desperate risks. All possible methods of preparation were employed, and surgical treatment finally was undertaken as a last resort. The seventh patient had a thyroid "crisis," or "storm," which is an extremely rare phenomenon at the present time. This patient had not been considered to be in as desperate condition as were the other six, and she had been prepared by the administration of Lugol's solution alone. Cardiac decompensation was absent, and there was no warning of an impending crisis. However, she died on the third postoperative day in thyroid crisis, despite use of all known supportive measures.

Prophylactic Thyroidectomy

As already indicated, we have done 2,994 consecutive thyroidectomies in the surgical treatment of both types of toxic goiter (exophthalmic and adenomatous) from 1946 through 1957. Seven deaths occurred in this entire group, all in patients with adenomatous goiter, giving an over-all hospital mortality rate of 0.2 per cent. This might be looked on as a highly satisfactory state of affairs, possibly as the ultimate in the irreducible minimum. However, during that same period, we did 6,150 consecutive subtotal thyroidectomies for simple, nontoxic, adenomatous goiter with three deaths, or a hospital mortality rate of 0.05 per cent. It appears obvious that here is a tremendous field for prophylactic surgical endeavor. My associates and I encounter carcinoma of the thyroid in approximately 10 per cent of all single nodules that are treated surgically, and the rate is approximately 5 per cent in the multinodular gland. Even though carcinoma never entered the question, the possibility of toxicity developing late in life and progressing to an alarming state before it is recognized leads us to be most specific in urging patients to have the apparently simple goiter removed, as a much more nearly ideal set of circumstances will prevail if treatment is undertaken before the toxic changes are apparent.

Conclusions

Although modern nonsurgical methods are effective in treating hyperthyroidism, a definite place remains for subtotal thyroidectomy.

The present-day extremely low morbidity and mortality rates for thyroidectomy have reached almost the logical end point. The proper preparation and selection of patients have been responsible for this.

The use of goitrogens as definitive therapy has been disappointing to many physicians and surgeons.

Use of radioiodine appears to be a rather simple, frequently effective and usually lasting therapy, especially for exophthalmic goiter. It may prove some day to be the method of choice but, at the present time, the still unknown factors concerning it have deterred us from its universal employment.

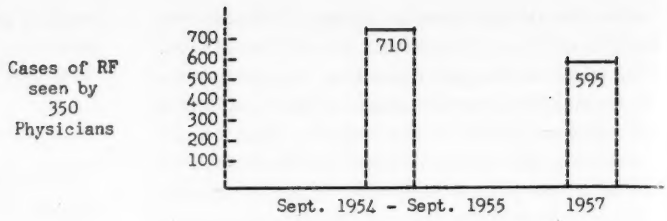


Fig. 1.

Rheumatic Fever Survey, 1958

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IN 1955, the Minnesota State Medical Association, Minnesota Department of Health, and the Minnesota Heart Association[1] participated in a statewide rheumatic fever survey. The results of the 1955 survey and the subsequent follow-up study[2] showed that nearly 3,000 cases of acute rheumatic fever were diagnosed by Minnesota physicians from September, 1954 to September, 1955.

The 1955 survey provided an excellent baseline for further study of this disease and the effect of current therapy on its incidence and pathogenesis. With this in mind, the Minnesota State Medical Association sent rheumatic fever questionnaires to all Minnesota physicians in June, 1958. The questionnaire dealt primarily with the 1957 incidence of primary and recurrent acute rheumatic fever and the methods of prophylaxis being used. The Heart Disease Control Program of the Minnesota Department of Health compiled and analyzed the data received in this survey.

On June 10, 1958, 3,100 questionnaires and cover letters were sent to Minnesota physicians. Of these, 1,361 questionnaires were returned (44 per cent). However, several of the questionnaires included the experiences of more than one doctor

in a clinic practice. An analysis of the reporting physicians by type of practice, in the 1955 and 1958 survey, is shown in Table I.

The above distribution of reporting physicians in 1958 corresponds very closely to the physicians in the 1955 survey.

Analysis of Rheumatic Fever Questionnaire

Question 1: How many cases of acute rheumatic fever have you diagnosed during 1957?

A. First Attacks..... 977

B. Recurrent Attacks..... 575

Of the 1,361 doctors reporting, 466 saw a total of 1,552 cases of acute rheumatic fever in 1957 for an average of 3.3 cases per year. In the 1955 survey, 597 doctors saw a total of 2,297 cases for an average of 3.8 cases per year.[1]

In order to identify more accurately any change in rheumatic fever incidence from 1954-1957, data were obtained from 350 general practitioners, pediatricians, and internists, who participated in both the 1955 and the 1958 surveys.

The same 350 physicians saw 115 (16.2 per cent) fewer cases of acute rheumatic fever in 1957 than in 1954-1955. The proportion of physicians by type of practice was the same in this sample of physicians as in the total reporting physicians.

Table II shows that physicians reporting cases in 1957 saw 14 per cent fewer cases than in 1954-1955. This agrees very closely with the 16 per cent reduction of cases seen in the practices of 350 physicians who reported cases in both surveys.

We must be cautious in the interpretation of this 14 to 16 per cent reduction in cases. Statistically, this decrease in reported cases is not significant. A reduction of this amount might be explained on the basis of actual decrease in incidence of the disease or by the adoption of more rigid criteria for the diagnosis of acute rheumatic fever.

Recurrent cases of rheumatic fever made up 37 per cent of the total reported cases for 1957. The age of the patient when he has his initial attack of rheumatic fever is a very important factor in determining his susceptibility to recurrences. If prophylaxis is not given, children who develop their primary attack under ten years of age have a recurrence rate of more than 75 per cent.[3] This recurrence rate drops progressively if the primary attack occurs in children over the age of ten years.

The 575 reported cases of recurrent rheumatic fever represents the experiences of about one-half of the physicians in the state who diagnose and treat this disease. We can then assume that the actual number of recurrences through the entire state was considerably more than 575. This means that the majority of these patients were not following a proper prophylaxis routine for one reason or another. We know that 85 to 90 per cent of recurrences can be prevented if a continuous prophylaxis regimen is faithfully followed.[4]

Question 2: How many of the cases of recurrent acute rheumatic fever in Question 1B required hospitalization?

A total of 264 (46 per cent) of the cases of re-

TABLE I. REPORTING PHYSICIANS 1958 AND 1955

Type of Practice	Number of Physicians Reporting		Percentage of Physicians Reporting	
	1955	1958	1955	1958
General Practice	713	577	45.8%	42.3%
Pediatricians	62	68	4.0	4.9
Internists	173	153	11.1	11.2
Surgeons	168	115	10.7	8.4
Others	440	448	28.2	32.9
Totals	1,556	1,361	99.8%	99.7%

TABLE II.

Type of Practice	Number of Physicians Seeing Cases		Number of Cases Diagnosed		Percentage of Total Cases Seen		Average Number of Cases Diagnosed/Year	
	1957	1954-55*	1957	1954-55	1957	1954-55	1957	1954-55
General Practice	359	456	1,158	1,725	74.6%	75.0%	3.2	3.8
Pediatrician	41	45	191	242	12.3%	10.5%	4.6	5.3
Internist	52	73	164	258	10.5%	11.2%	3.1	3.5
Surgeon	6	12	12	48	0.8%	2.0%	2.0	4.0
Other	8	11	13	24	0.8%	1.0%	1.6	2.1
Mayo Clinic			14		0.9%			
Totals	466	597	1,552	2,297	99.9%	99.7%	Average 3.3	Average 3.8

*September 1954-September 1955.

current rheumatic fever reported in the survey required hospitalization.

Recurrent rheumatic fever is not only costly to the patient in terms of producing chronic cardiac disability and decreasing life expectancy, but also in terms of dollars and cents. The 264 patients who were hospitalized for acute recurrent rheumatic fever represent those patients seen by only one-half of the physicians in the state. The actual number of hospitalized cases in the entire state probably is nearer 500.

The average stay in the hospital for a case of acute rheumatic fever is two weeks, and the cost per hospitalization about $325.00. These figures are based on a study of 500 hospitalizations for acute rheumatic fever during 1957 and 1958. This means that approximately $175,000.00 was spent in 1957 for medical expenses and hospitalization resulting from acute recurrent rheumatic fever. This, however, is only a down payment. With each recurrence, particularly if valvular disease is established, the likelihood of further cardiac damage increases. These patients in later years often require many hospitalizations for bouts of cardiac failure and for the many complications of chronic rheumatic heart disease.

Question 3: (A) What method(s) of prophylaxis are you using on the patients mentioned in Question 1 to prevent recurrent attacks of acute rheumatic fever? (Please list *number* of patients and *length* of time you plan to keep these patients on each method of prophylaxis.) Refer to Table III.

Length of time patients are being kept on prophylaxis by method of prophylaxis: Refer to Table IV.

Some of the reporting physicians included patients who had attacks of acute rheumatic fever prior to 1957 in the question on prophylaxis. However, the vast majority of physicians gave prophylaxis data just on cases occurring in 1957: 80.6 per cent of patients receiving prophylaxis are getting medications at regular intervals for varying lengths of time; 14.7 per cent of patients on prophylaxis are getting drugs at intermittent intervals, particularly in the winter and spring months; about 5 per cent of the patients who developed acute rheumatic fever in 1957 are not on any prophylactic regimen.

The methods of prophylaxis used on patients diagnosed as having acute rheumatic fever in 1957 should reflect the philosophy of the physician toward prophylaxis. Therefore, with some exceptions, he probably uses similar method(s) of prophylaxis on all his patients who have had rheumatic fever prior to 1957. We thus should be able to show whether a relationship exists between the various methods of prophylaxis and the recurrence rate. At most, we can only hope to show a general trend between the above variables.

The over-all number of recurrences among the total 1,552 reported cases of acute rheumatic fever was 575 (37 per cent). Figure 2 includes comparisons between method of prophylaxis and recurrences only in those instances when the physicians reported a definite number of recurrent cases, a definite number of identifiable patients on prophylaxis, and a stated length of time these patients will be on prophylaxis.

TABLE III.

Method of Prophylaxis	Number of Patients	Length of Time You Plan to Keep Patients on Each Method of Prophylaxis
Continuous Prophylaxis	1,424	Please see table below
Intermittent Prophylaxis	260	
None	82	

TABLE IV.

Length of Time Patients are to be on Prophylaxis	Method of Prophylaxis			
	Continuous Prophylaxis		Intermittent Prophylaxis	
	Number of Physicians	Number of Cases	Number of Physicians	Number of Cases
Under 1 year	45	135	34	70
1-5 years	137	399	29	53
6-10 years	16	82	3	9
Indefinitely	110	493	13	44
Until 14-18 years of age	33	129	1	1
Until over 18 years of age	33	119	4	12
Indefinite	18	67	10	26
PRN	—	—	14	45
Totals	392	1,424	108	260

PROPOSED LENGTH OF TIME ON PROPHYLAXIS

It must be remembered that there is a marked difference in numbers of cases when these three methods of prophylaxis are compared. Eighty per cent of the patients are on continuous prophylaxis for various periods of time. When continuous prophylaxis is analyzed, it is seen that physicians who use long periods of prophylaxis (five years or longer) reported fewer recurrent cases among their total cases for 1957. Possibly physicians who prescribe long-term prophylaxis have better patient co-operation, with fewer lapses in therapy and consequently fewer chances for recurrences to occur.

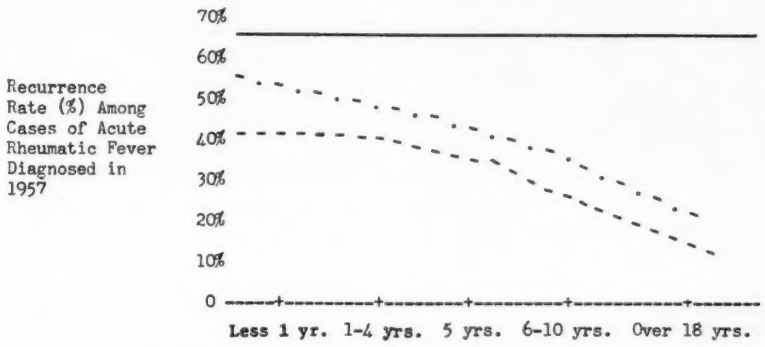


Fig. 2. (– –) *Continuous Prophylaxis:* 231 doctors—695 cases; 247 recurrences (35.5 per cent). (–•–) *Intermittent Prophylaxis:* 62 doctors—153 cases; 74 recurrences (48.3 per cent). (—) *No Prophylaxis:* 16 doctors—31 cases; 20 recurrences (64 per cent).

Question 3 (B) What type of prophylactic medication are you giving patients who have had acute rheumatic fever? (Please check medication (s) you are using.)

1. Oral Penicillin..... 443
2. Injectable Penicillin..... 270
3. Sulfa 155

The majority of reporting physicians who treat this disease checked oral penicillin as the drug used in the prevention of recurrent rheumatic fever.

The problems of treatment and prevention of rheumatic fever are difficult ones. In many cases, the diagnosis is in doubt because the presenting symptoms may be non-specific. When the diagnosis is difficult to make, the decision on long-term prophylaxis presents an even greater problem. Patients often feel entirely normal between attacks of rheumatic fever. For this reason, it is hard for a family or patient to realize he needs medication for a long period of time, possibly for life.

We do know that the prompt treatment of streptococcal infections and the use of recommended prophylactic regimes will prevent 85 to 90 per cent of acute rheumatic fever. The American Heart Association recommends the following routine in rheumatic fever prevention. (Taken from the second revision of the American Heart Association statement on prevention of rheumatic fever. Published in *Circulation,* Volume 15, 1957)

PREVENTION OF PRIMARY RHEUMATIC FEVER

Treatment of Streptococcal Infections

1. Intramuscular penicillin-Benzathine penicillin G
   Children: One intramuscular injection of 600,000 to 900,000 units.
   Adults: One intramuscular injection of 900,000 to 1,200,000 units.
2. Intramuscular penicillin-Procaine penicillin with aluminum monostearate in oil.
   Children: One intramuscular injection of 300,000 units Q 3 days for 3 times.
   Adults: One intramuscular injection of 600,000 Q 3 days for 3X
3. Oral penicillin
   Children and Adults: 200,000 to 250,000 units TID for 10 days
4. Broad Spectrum antibiotics
   Children and Adults: Therapeutic doses for 10 days.

PREVENTION OF RECURRENT RHEUMATIC FEVER

Prevention of Streptococcal Infections

1. Intramuscular penicillin-Benzathine penicillin G
   Children and Adults: 1,200,000 units per month
2. Oral penicillin
   Children and Adults: 200,000 to 250,000 units Q day or BID. The latter is preferred.
3. Oral sulfadiazine
   Children and Adults: 0.5 to 1.0 grams per day. The smaller dosage is for children under 60 pounds.

Streptococcal infections can occur at any age and recurrences of rheumatic fever have been reported in the older age groups. The American Heart Association therefore recommends that the safest general procedure is to continue prophylaxis indefinitely.

Question 4: (A) How many clinically inactive rheumatic fever patients do you have who you believe should be on continuous prophylaxis, but who are not, for some reason? (Please list *number* of such patients on the right.)

(A) 1,059

(B) How many of these patients are not on continuous prophylaxis because of the following reasons? (Please list *number* of such patients on the right.)

(B)

1. Lack of interest on the part of the parent or patient 625
2. Reaction to the drug(s)..... 26
3. Cost of prophylactic drugs(s)..... 262
4. Other not stated..... 146

At least 1,059 patients are not on continuous prophylaxis although such a regimen was prescribed by their physicians. Two-thirds of these patients are not on the prescribed medication because of their lack of interest and one-fourth because of the cost of the prophylactic drugs. Only 2.4 per cent of the patients were not able to take medications because of drug reactions.

Summary

The survey shows quite definitely that rheumatic fever is still a problem in Minnesota. Although the average number of cases seen by physicians in 1957 was 15 per cent below the 1954-55 average, we cannot say this was entirely due to an actual decrease in the incidence of the disease. If the degree of over-reporting was the same as the 1954-55 study, a conservative estimate would be that 2,400 cases of acute rheumatic fever were diagnosed and treated by Minnesota physicians in 1957.

It is also evident that methods and length of prophylaxis vary a great deal throughout the State. Several factors account for the many different prophylaxis routines, some of which have been mentioned in the discussion of the survey question. Past experience with the disease guides physicians as to the method of prophylaxis they use.

The large number of patients who are not on a continual prophylaxis program, although it has been prescribed, brings out the need for an active patient and parent educational program. If untreated, it is expected that 10 per cent of these patients will have a recurrence within one year. The most successful education of these patients and parents can be done directly by physicians.

Of the total cases of reported acute rheumatic fever in 1957, 37 per cent were recurrences. Of the estimated 1,000 recurrent cases in 1957, 90 per cent could have been prevented by means of a secondary prophylaxis program at a cost of approximately $20,000.00. These same 1,000 recurrences cost $175,000.00 alone in hospitalization and medical expenses, plus the immeasurable cost to the patient in terms of increased valvular damage which may occur with each recurrence.

We thus have evidence that there is not only a need for an active educational program in combatting rheumatic fever, but also for an adequate secondary prevention program. These programs can be achieved only through the co-operation and participation of the medical profession, voluntary agencies, and the official agencies who are concerned with the prevention of this disease.

Some basic questions which must be considered during the development of a rheumatic fever prevention program are:

1. What can be done to promote patient and parent acceptance of recommended prophylaxis against rheumatic fever?
2. What part should the official and voluntary agencies play in promoting a secondary rheumatic fever prevention program?
3. What is the best means of getting participation of the practicing physicians in a secondary prevention program?
4. Who should take the administrative responsibility for developing the mechanics and operating a prevention program?
5. What type of secondary prevention program would be best suited to Minnesota in terms of: (a) case finding and registry; (b) provision, dispensing, and cost of drugs; (c) follow-up?

References

1. Fleming, D. S., Hirschboeck, F. J. and Cosgriff, J. A.: Minnesota rheumatic fever survey, 1955. Minnesota Med., 39:208-13 and (Apr.) 1956.
2. Rosenfield, A. B. and Erlanson, A. C.: Rheumatic fever survey follow-up study. Minnesota Med., 40:102-03 (Feb.) 1957.
3. Bland, E. F. and Jones, T. D.: Rheumatic fever and rheumatic heart disease. Circulation, 4:836, 1951.
4. Wannamaker, L. W. and Rammelkamp, C. H., Jr.: Prophylaxis of acute rheumatic fever. Am. J. Med., 10:673, 1951.



Fig. 1. Cerebral calcification denoted by arrow. AP view.



Fig. 2. Very extensive calcium deposits are to be noted on lateral view of skull of infant B.A.

Toxoplasmosis in a Newborn Infant

Case Presentation

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Fatal toxoplasmosis in a newborn infant is rare. A beautifully documented case report is recorded. The over-all problem of toxoplasmosis in pregnant women and in newborn infants is reviewed.

Case Presentation

BABY B. A. was born December 26, 1958. During mid-January, 1949, he developed difficulty with feeding and unexplained fever. This did not respond to the usual medications available. On January 27, 1949, he was sent to the University Hospital for diagnosis and treatment. On admission to that hospital, the baby appeared to be rather acutely ill with some generalized hyperactivity of reflexes and a marked tremor of his arms, especially on the right. A spinal puncture was done which revealed an increase of total cell count and a protein of 355 mg. per cent. There was a slight amount of blood elicited with this tap so its accuracy was not certain, but a repeat tap showed a total of 76 cells with a protein of 768, and sugar of 28 mg. per cent.

The patient was started on sulfadiazine as well as streptomycin and penicillin. He had a leukocytosis on admission of 20,850 cells per cu. mm., with N32, L60, and E8. The second count revealed 22 per cent eosinophils. This suggested toxoplasmosis. Routine skull x-ray (Fig. 1) revealed diffuse calcification consistent with the diagnosis of toxoplasmosis. Streptomycin and penicillin were discontinued at this time. A ventriculogram was performed which revealed a marked internal hydrocephalus. The Sabin-Feldman dye test for toxoplasmosis was positive in serum diluted 1:512. The child was continued on sulfadiazine in fairly large doses. At that time it appeared that the drug was effective against toxoplasmosis. The baby continued to take sulfadiazine, and was discharged to his family physician with a poor prognosis. The dye test for toxoplasmosis on the mother was found to be positive in serum diluted 1:512 and the father was negative.

The patient was re-admitted to the University Hospital on April 20, 1949, and discharged on May 21, 1949. He died on May 22, 1949. While he was in the University Hospital on the second admission he had a lamina terminalis puncture. There were numerous adhesions around the right choroid plexus. These were broken up. The lamina terminalis was visualized and a hole about 1 cm. in diameter was made. This tissue was examined

and found that it contained very many gemistocytic astrocytes, probably indicative of toxoplasmosis activity.

Initially, the child did quite well, but by the fifth postoperative day he developed spasticity and vomiting. Ventricular taps were done as needed. The outlook seemed very poor because of the activity of toxoplasmosis, and, in all probability, the ventriculostomy became occluded because of proliferation of infected tissue. The prognosis was poor from the beginning.

A postmortem examination was refused, but a positive diagnosis of toxoplasmosis could nevertheless be made in this case.

The Problem

Because of the unusual nature of this disease, certain questions were asked and the author found that few answers were known. One of the questions that arose at the time was: How had the infant acquired the disease? It was found that it was most likely a congenitally-transmitted disease in this case. There was no particular reason to suspect anything like it, because the mother has been perfectly healthy during her pregnancy and had no symptoms indicating the presence of any acute disease. Here was a situation where an apparently perfectly healthy young woman had a disease which did not produce any recognizable symptoms during her pregnancy and yet was severe enough to be passed on to her child and cause his death after delivery. Inasmuch as the answers to some of the questions were not obtainable at the time, it was decided to investigate further this situation in obstetrical patients. A considerable amount of correspondence was had with the University Hospital staff members and, in particular, with Dr. Richard Smith. He was very helpful in the discussions concerning this disease.

Discussion

In order to find out more about this disease, it was necessary to enlist the aid of the laboratory section of the State Board of Health.

From 1949 to 1954, one or more blood samples from 327 obstetrical patients was sent in to the State Board of Health Laboratories. Because of this initial sampling, a number of corollary studies have been done and have been reported elsewhere,[1,2] and some questions have come to mind, the answers to which might be of interest to all physicians who have an obstetrical practice.

1. How is the disease transmitted or acquired after birth? This is not known.[3] It is presumed to be transmitted from animals to man but whether it is inhaled, ingested, or inoculated by an insect vector is not known.

2. How widespread is the disease in the general population of Minnesota? If we consider the dye test to be absolutely specific and there is no evidence that it is not specific in humans, then about 1 per cent of the population of Minnesota acquires toxoplasmosis each year.[1]

Therefore, about 10 per cent of ten-year-old children have had toxoplasmosis; about 20 per cent of twenty-year-olds, and so forth.

3. Is the disease more prevalent in males or females? All studies show no significant sex difference in the acquisition of toxoplasmosis.[4]

4. What age group does it affect most or are all age groups susceptible? All age groups are susceptible.[4]

5. Does immunity develop without evidence of the disease? Yes. Infection (and the resulting immunity) without clinical illness is usual when the infection is acquired after birth. A good example of this is found with the mothers of the infants in the congenital cases. The State Board of Health has accepted thirty-six as congenital cases from January 1949 to date. (Twenty-nine of the thirty-six were Minnesota residents). Only one of the thirty-six mothers reported a febrile illness during pregnancy.

6. What are the primary symptoms of the disease in humans? Congenitally-acquired toxoplasmosis during the neonatal period shows signs of encephalitis, rash, jaundice and hepatosplenomegaly. The appearance and clinical course may suggest erythroblastosis. Hydrocephaly, microcephaly or chorioretinitis may also be present. The child may be born dead showing these manifestations. Should the child survive during infancy and childhood, there may be hydrocephaly, microcephaly, convulsions and/or psychomotor retardation in conjunction with chorioretinopathy. Chorioretinopathy is considered essential to the establishment of a firm diagnosis in this group of cases. The other conditions above may be due to a number of different causes. Cerebral calcification is common but not universal.[5]

Postnatal acquired toxoplasmosis may have a wide spectrum of manifestations of illness. Most infections are inapparent, as is evidenced by the number of persons with positive dye tests whose histories do not suggest any particular illness that could be construed as having been the responsible

infection, nor do these persons have any physical findings that would suggest past infection. It is rare for mothers who transmit the disease to their offspring to be able to describe any suspicious illness during the course of pregnancy. It is reasonable to suppose that some types of cases so far described in proven acquired toxoplasmosis are those with generalized lymphadenopathy,[6] and those with a rash of Rickettsial character.[7] The problem of the frequency of the connection between chorioretinitis in adults and acquired toxoplasmosis has not yet been settled.[8] In this connection, it is well to remember that chorioretinitis in children may make a delayed appearance. It has been the practice of the State Board of Health arbitrarily to put the age of twelve years as the dividing point as to the time when a chorioretinitis may have been the result of a congenital infection, and the time when it is probable that the chorioretinitis was acquired (whether due to toxoplasmosis or not).

Acquired toxoplasmosis, whether of the glandular or exanthematous type, is of course a febrile disease. The first symptom of chorioretinitis is blurred vision. Ophthalmoscopic examination is necessary to define the character of the lesion.

7. What are the pathologic conditions to be recognized or to be watched for in making a diagnosis? This has been to some extent answered in the above discussion. None of these symptoms or signs, alone or in combination, is absolutely diagnostic. Specific diagnosis can be accomplished by isolation of *Toxoplasma gondii* or by serologic methods properly interpreted. The commonest conditions for which toxoplasma tests are requested are psychomotor retardation, convulsive states, and chorioretinitis. In congenital toxoplasmosis, the tetrad of chorioretinitis—cerebral calcification, hydrocephaly or microcephaly, and psychomotor retardation—is most often attended by serologic confirmation. Requests for toxoplasmosis studies should always be just one part of a general and complete work-up. Overt toxoplasmosis is still too unusual a clinical entity to have a diagnostic priority in the mind of the physician. This attitude should apply to the acquired glandular and exanthematous forms also.

8. What serological results on the mother indicate no need to expect congenital transmission? (a) If the mother is not infected, the dye test is negative during pregnancy and also at delivery. (b) If the mother has an old infection, the dye test is positive and the complement fixation tests negative on the mother's blood both during pregnancy and at the time of delivery. A positive dye test and negative complement fixation test during the pregnancy only, would usually mean an old infection, but in rare instances would indicate a recent infection. A test of the mother's blood at the time of delivery should be made to look for a rise in titer in the dye test and in a change from negative to positive complement fixation tests to exclude this rare possibility.

9. What serologic results on the mother indicate the possibility of congenital transmission? (a) A mother with recent infection or infection during pregnancy would show a negative dye test during pregnancy and show a positive dye test at the time of delivery. (b) If her dye test was positive and her complement fixation test negative during pregnancy with the complement fixation tests changing to positive at the time of delivery. (c) If her dye test was positive (1:256 or higher) and the complement fixation tests positive in dilution 1:8 or higher, both during pregnancy and at the time of delivery. This type of reaction could be expected in about 1 to 2 per cent of pregnant women. The types of reactions showing an increase in positivity during the pregnancy could be expected in less than 1 per cent of obstetrical patients.

10. What serological results on the infant confirm suspected congenital transmission? The dye test titer in the infant must be as high or higher than that in the mother and be maintained at that titer past the age of three months. The complement fixation tests may be positive or negative at birth; if negative, the complement fixation will change to positive in dilution 1:8 or higher within three months or earlier.[9] Dye test titers lower than 1:256 have not been observed in patients with congenital toxoplasmosis nor in the mothers or the patients when the testing is done within the first year of the infant's life. Usually the dye test titers on patients are positive in dilution 1:1024, 1:4096 or occasionally higher.

11. How many years may go by in any given case before any danger from the effect of the congenital disease may be considered past? The answer to this question is not known. It is possible, but not proven, that chorioretinitis in adults may be a late manifestation of the congenitally transmitted disease.

12. Do obstetric patients infect the offspring of more than one pregnancy? No, or at least none have been reported in the literature. This suggests that the length of time after acquiring the infection in which it can be transmitted to the fetus, is relatively short.

13. Is the disease prevalent enough in the general population, particularly in obstetric patients, to warrant checking all pregnant women, cord bloods at birth, and follow the titers of babies following delivery? The prevalence of this disease in terms of the actual potential of congenital transmission is not known. Based on the 327 patients in the author's series and the 272 who were followed, it can be said that less than 3 per cent have serological results indicating that transmission is possible.[1] How often congenital transmission occurs in this 3 per cent is unknown, but prevalence is not the crux of this question. If the 80,000 obstetric patients in Minnesota were tested each year and 2,000 of them with serologic results indicating that a transmission of toxoplasmosis was a possibility, treatment could not be recommended for these 2,000 women on the basis of the unknown risk to the child. Few of these 2,000 women would transmit the disease to their offspring even if untreated. Also, treatment of these 2,000 pregnant women could not be recommended because the drugs are moderately toxic and their treatment value is not well established.

One must also mention cost. These tests are markedly more expensive than tests for syphilis. Therefore, an extensive case-finding program would be prohibitive in cost, inasmuch as multiple tests are necessary on each patient. The expenditure of funds is better directed toward learning how the disease is transmitted so that pregnant women can be advised how to avoid the risk. Basic research for better therapeutic agents is also a real need and this is being carried on in several places.

14. What is the treatment for acute toxoplasmosis, if any? Pyrimethamine (an antimalarial drug) combined with one of the sulfa drugs is recommended.[10] These have had only limited trial and should be used with caution. Pyrimethamine is moderately toxic.

Conclusion

The routine examination of the blood of all obstetric patients with specific reference to the finding of toxoplasmosis titers would be unwarranted. If there are other conditions and symptoms suggesting that such a blood study might be utilized, only then could such tests be recommended. Sabin has stated the situation very well: "It may well be that all future studies will show that in toxoplasmosis we have an example of that almost perfect host-parasite relationship in which the parasite only rarely causes serious damage to its hosts and the hosts are not too intent on destroying the parasite—in other words a great deal of infection and very little disease."[11]

Acknowledgments

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References

1. Kimball, A. C., Cooney, M. K., Bauer, H., and Sheppard, C. G.: Studies on toxoplasmosis. II. Toxoplasma antibodies in obstetrical patients with extensive serological follow-up. J. Immunol., 81: 182-193, 1958.
2. Kimball, A. C., Bauer, H., Sheppard, C. G., Held, J. R., and Schuman, L. M.: Epidemiological studies on toxoplasma antibodies in obstetrical patients. Univ. of Minnesota M. Bull., 30:226-249, 1959.
3. American Public Health Association: Control of Communicable Diseases in Man. 8th ed. p. 185. New York: American Public Health Association. 1955.
4. Feldman, H. A., and Miller, L. T.: Seriological study of toxoplasmosis prevalence. Am. J. Hyg., 64:320-325, 1956.
5. Sabin, A. B., Eichenwald, H. F., Feldman, H. A., and Jacobs, L.: Present status of clinical manifestations of toxoplasmosis in man. Indications and provisions for routine seriologic diagnosis. J.A.M.A., 150:1063-69, 1952.
6. Siim, J. C.: Acquired toxoplasmosis: Report of seven cases with strongly positive serological reactions. J.A.M.A., 147:1641-5, 1951.
7. Pinkerton, H., and Henderson, R.G.: Adult toxoplasmosis. A previously unrecognized disease entity simulating the typhus-spotted fever group. J.A.M.A., 116:807-14, 1941.
8. Sabin, A. B.: Human toxoplasmosis with special reference to intraocular inflammation; a critical review. Am. J. Ophth., 41:600-606, 1956.
9. Eichenwald, H. F.: The laboratory diagnosis of toxoplasmosis. Ann. New York Acad. Sc., 64:207-211, 1956.
10. Eyles, D. E.: The present status of the chemotherapy of toxoplasmosis. Am. J. Trop. Med., 2:429-444, 1953.
11. Sabin, A. B.: Toxoplasmosis: Current status and unsolved problems. Am. J. Trop. Med., 2:360-364, 1953.

Editorials

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ANTIHYPERTENSIVE AGENTS

I. The Role of Diuretics

The advent of potent oral diuretics such as chlorothiazide (diuril) and its analogue hydrochlorothiazide (esidrix; hydrodiuril) promises to revolutionize the treatment of hypertension. These agents have a modest hypotensive action when administered alone, and they are even more effective in enhancing the hypotensive response to ganglion-blocking agents and hydralazine (apresoline). To a lesser extent, they augment the antihypertensive action of compounds of Rauwolfia and Veratrum.

The mechanism by which chlorothiazide and hydrochlorothiazide reduce blood pressure has not been definitely elucidated. Long-term administration of chlorothiazide leads to a decrease in the volume of extracellular fluid and plasma, even in nonedematous patients. Cardiac output is also reduced, possibly as a result of this. Whether this nonspecific effect of diuresis is the modus operandi or whether there is a more specific and esoteric hypotensive action is a matter of dispute.

Unlike other hypotensive agents, chlorothiazide produces extremely few unpleasant side effects and is consequently well tolerated by most patients. Only rarely do gastrointestinal symptoms such as nausea, vomiting, abdominal distress and diarrhea force cessation of therapy. Some patients complain of a dry mouth or an unpleasant taste or both and some describe a vague weakness, but these symptoms seldom are intolerable, and they usually bear no relationship to the level of serum potassium.

Disturbances in blood electrolytes are the most frequent and potentially most serious side effects produced by long-term administration of chlorothiazide or hydrochlorothiazide. Hypopotassemia (serum potassium less than 3.5 mEq. per liter) occurs in approximately 40 per cent of patients at some time during therapy with chlorothiazide. Yet only rarely are clinical symptoms present to suggest potassium deficiency, and hence it will escape detection unless routine determinations of serum potassium are made. The administration of supplementary potassium is advisable if the value for serum potassium is low or if patients become acutely ill or require operation. In the latter instances, intake of potassium is sharply curtailed and losses are likely to be exaggerated; consequently, severe hypopotassemia may be precipitated rather abruptly if body stores of potassium already are partially depleted by prolonged administration of chlorothiazide. Supplementary potassium should be given routinely to patients who are taking digitalis in addition to chlorothiazide, since hypopotassemia aggravates digitalis intoxication.

Attempts to consume more foods rich in potassium, such as orange juice, usually do not suffice to prevent hypopotassemia, especially during acute illnesses. A preferable and more reliable method is the regular administration of tablets of potassium chloride or a solution of potassium triplex. It is not uncommon that supplements of potassium in the order of 90 mEq. per day (approximately 7 gm. of potassium chloride or 24 ml. of potassium triplex) will be required to prevent hypopotassemia in patients taking 1 gm. of chlorothiazide daily. In stressful situations, when losses are exaggerated, more than this amount may be necessary. The physician must not allow himself to be lulled into a false sense of security by administration of supplementary potassium, for this is not a guarantee against hypopotassemia.

Like serum potassium, the blood urea (or nonprotein nitrogen) should be determined at regular intervals when patients are receiving chlorothiazide, since an increase in blood urea occurs in about 20 per cent of hypertensives who have normal pretreatment values. The value for urea usually returns to normal despite continued therapy. When it does not, forcing fluids or reducing the dose of chlorothiazide is sometimes effective in correcting this abnormality. In some cases, the urea remains persistently increased at levels of 50 to 60 mg. per 100 ml. (normal is 40 mg. or less) as long as chlorothiazide is administered. Evidence of progressive deterioration in renal function as the result of chronic administration of chlorothiazide has not been forthcoming, but persistent increases in blood urea are certainly a source of concern.

Pre-existing azotemia, even though of mild degree, is a signal for extra caution, because further and sometimes alarming increases in blood urea occur in nearly 50 per cent of such patients when chlorothiazide is administered.

When renal function is normal, chlorothiazide rarely produces abnormalities in serum sodium or in plasma chloride or carbon dioxide. Increase in uric acid sometimes occurs, and hyperglycemia has been attributed to administration of chlorothiazide.

Purpura, thrombocytopenia and anemia have resulted from treatment with chlorothiazide, but such instances are rare when one considers the large number of patients who have been treated with this drug.

So effective is chlorothiazide in enhancing ganglionic blockade that care must be exerted to prevent orthostatic collapse when this diuretic agent is added to the regimen of a patient taking a ganglion-blocking drug. In such instances, the dose of ganglion-blocking drugs should be reduced about 50 per cent in anticipation of adding chlorothiazide, and the latter should be administered in small doses (250 mg. twice daily or less) at first.

Orthostatic hypotension also can result from combination therapy with chlorothiazide and hydralazine.

If chlorothiazide and similar diuretic agents prove to be relatively free of toxic side effects when used for long periods, and if their administration is judiciously monitored by periodic determination of serum potassium and blood urea, this new class of antihypertensive drugs may well sound the death knell of Rauwolfia and herald a limited renaissance of surgical sympathectomy.

Experience has shown that Rauwolfia is a deceptive drug; the longer it is used, the less one respects its hypotensive properties and the more one fears its insidious and late side effects. Most dangerous among these are depression and a parkinsonianlike state, both of which may be so well disguised that they escape detection of patient, family and physician alike until serious disability results. Despite these objections, Rauwolfia has been used widely, although at times reluctantly, as a cornerstone on which to build a therapeutic regimen. For some patients, it suffices as the sole hypotensive agent; for those who need additional therapy, it tends to reduce the incidence and severity of unpleasant side effects produced by more potent agents. Until the advent of effective oral diuretics, there was no substitute for Rauwolfia in this role of advance guard in the attack on hypertension. Chlorothiazide and hydrochlorothiazide, however, are proving to be even more effective than Rauwolfia in reducing blood pressure, either alone or as adjuncts to therapy with hydralazine and ganglion-blocking drugs. Moreover, chlorothiazide rarely produces symptomatic side effects itself and, when used in combination, it usually permits better control of blood pressure with smaller doses of those antihypertensive drugs that do tend to cause unpleasant symptoms. It has been my impression that, like Rauwolfia, it also reduces the frequency and severity of tachycardia, palpitations and headache that often accompany the administration of hydralazine.

If continued experience bears out early observations that chlorothiazide is uniquely effective in reducing blood pressure after thoracolumbar sympathectomy, it is conceivable that a limited, one-stage procedure that would leave the male reproductive functions intact could, with the addition of chlorothiazide, be an extremely effective weapon in the management of hypertension. For selected patients, this type of combined surgical and medical approach might be accompanied by fewer side effects than would extensive surgical or intensive medical therapy alone.

The net result of the introduction of diuretic agents into the field of antihypertensive therapy is better control of hypertension with fewer unpleasant side effects from drugs. This should mean ultimately that more patients who have mild and asymptomatic hypertension will be able to take advantage of the protection that effective treatment almost certainly affords without sacrificing their comfort. The physician must realize, of course, that late toxic effects from chlorothiazide may yet appear, and this specter must temper his judgment as he balances the risks of untreated hypertension against the risks of therapy for each patient.

RAY W. GIFFORD, JR., M.D.

MEDICINE'S GREATEST PROBLEM

The most outstanding problem, as the twentieth century grows older, is that humanity through discovery of powerful scientific means is threatening radical change of human nature itself. The very basis of human existence, which had remained stable for thousands of years, appears to have been

upset and altered. Contentment has been outstripped by infinite desire for power and control over even space beyond. Science and myth are fast becoming one.

Man, through his restless creative drives, is producing ever-changing environment which needs adaptation at every turn. The acceleration of change of these new stresses, new efforts and new endeavors constitute a challenge to our organism and personality. Humanity must either meet the challenge satisfactorily or succumb to it. If the old idea that disease is the result of lack of harmony with nature is true, the rapid change in man's new environment is the great problem of the medical science tomorrow.

It comes to this, then, that the technocratic advance in this atomic age would create not only cosmic catastrophe but also newer problems in contemporary medicine concerning both biophysical and biological adaptation. Can human beings keep pace with this new change?

Humanity sooner or later would desire to be immortal or to have a longer life adequate for inter-planetary travel. Due to victory over infective diseases, the expectation of life has definitely become longer in the present century than it has ever been before. The degenerative process of wear and tear, however, continues relentlessly although at a slower pace. We are living longer but dying gradually; in other words, modern medical science in a large measure has "exchanged mortality for morbidity." This disparity between rate of cosmic and biological advancement is bound to create an impact leading to increase in stress syndrome and emotional crises, which would be the problem of problems with the advance of science.

If humanity fails to adjust itself to this pace of progress, the science of medicine will have to devise an effective check on these emotional crises. This, I believe, will give a new dimension to medical science to make it dynamic and anticipatory instead of episodic, as at present.

Thus, the main problem of medical science is to make man more capable of adjusting himself to his complexes and environment. The challenge of matter must be met by the mind of man, which may evolve a new art of life in answer to the challenge of the age.

DR. MD. ILBRAHIM

HYPNOSIS IN MEDICINE

Since the report of the Council on Mental Health of the AMA on hypnosis was published, there has been an increasing interest in hypnosis by the medical profession. This rather sudden and widespread interest is somewhat forboding to anyone who believes that hypnosis may serve a useful purpose in medicine and in other aspects of life. There is a natural tendency to fear that history may repeat itself, meaning that the present interest would fade away into a state of apathy to the potentialities of hypnosis.

The only compelling reason for history to repeat would be negated by putting hypnosis in its true perspective among the many techniques which the physician has to aid his patients. Every physician knows that patients often feel better simply as the result of a visit to his office and a talk with him. Physicians also know that medicine has a psychological value over and beyond the physiological changes produced by the drug. Every physician knows that the morale of the patient and the "will to live" often have an effect upon the prognosis of a disease. Physicians know that psychological etiology is outstanding in some types of disease and discomforts suffered by patients. In short, psychological factors are important in the causation, treatment, and course of disease.

How do these commonly known medical facts relate to hypnosis? It is simply this: Hypnosis is a powerful tool for manipulating psychological factors. Like any other instrument, drug or technique, sometimes it doesn't work at all; sometimes it doesn't work very well; and sometimes it works extremely well; and sometimes it cannot be used. As is characteristic at the moment of most psychological techniques, our predictability of how it will work in a given patient is not as good as it is for many of the physiological procedures and more mechanical techniques.

Psychologically, what is hypnosis? It is an attitude or mood of great receptivity to the words and actions of the hypnotist. To paraphrase a recent writer, Barbar, the process of going into hypnosis involves on the part of the patient these steps:

1. He becomes more and more concerned with words of the hypnotist and with those aspects of his self and his surroundings to which the hypnotist specifically directs the patient's attention.

2. He becomes more and more ready and willing to carry out the instructions of the hypnotist.

3. He comes gradually to believe that what the hypnotist says is the literal truth, and what the hypnotist says will happen is going to happen. In other words, the patient comes to think as the hypnotist wants him to think.

Now, surely, to the extent that these steps are effectively carried out by the patient, and to the extent that the physician knows how to direct the thoughts of the patient for the latter's benefit, it is obvious that this mood of receptivity, hypnosis, would give the physician greater control over the psychological factors underlying the patient's disease or discomfort.

However, only "good" hypnotic subjects can carry through all of these steps to the maximum degree, and even they do not become automatons to be pushed around at the will of the hypnotist. The most excellent hypnotic subject will go through the steps on a permissive basis, and should the hypnotist attempt to abuse this permissiveness, the subject can withdraw his permission. However, the medical man will usually be working within the permissive limits of the patient, except perhaps in some cases of deep psychotherapy where the therapist may run into material which the patient consciously or subconsciously wishes to keep hidden.

Paradoxically, perhaps, the greatest medical use of hypnosis will likely not lie in the field of deep psychotherapy, and most medical uses of hypnosis do not necessarily require that the patient be in deep hypnosis. Perhaps the most widespread medical use of hypnosis is that of relieving anxiety and tenseness. Look at steps 1 and 2 above! If the patient will concentrate his attention to the words of the hypnotist, that of itself will draw his attention away from what is causing anxiety and tenseness. Then as the patient carries out the instructions of the hypnotist, which are always in clinical hypnosis directions for relaxation, that relaxation will occur. Then with carefully chosen words and skillful psychological manipulation, the physician can begin to change some of the erroneous ideas of the patient and make beneficial substitutions. By this means, to give a few examples, the patient can be prepared for childbirth, given training preliminary to general anesthesia, and for postoperative comfort, relieved of anxiety and tension engendered by the anticipation and performance of many medical examinations. The patient may also be brought to a new philosophy of life which may result in the alleviation of some of the psychosomatic disorders.

There is evidence that in many patients the discomfort of burns may be alleviated, and some physicians believe the progress of healing is promoted. In some cases, the patient's discomfort in the terminal phase of incurable disease can be lessened.

This list of possible uses could extend endlessly, but a general restatement will have to suffice: Where psychological factors are an important factor in medicine, hypnosis is a technique which gives some possibility of control of these factors.

Looking at hypnosis as set forth above, it does not appear particularly esoteric, magical or unusual. It is simply carrying on in a more deliberate and perhaps effective manner what every physician seeks to do. It simply is using in a more formal way what the physician is already using. For example, the patient is already set to pay attention to what his physician says, otherwise he wouldn't come to the office. He is usually willing, at the moment, to carry out the physician's instructions, although his willingness may often disappear rather quickly after he leaves the office.

However, by the use of hypnosis the physician can increase the probabilities that the patient will behave as the physician tells him to. Of course, the probabilities will not reach 100 per cent. The use of hypnosis simply allows the physician to work with greater odds in his favor, and by the same token in favor of the patient. This is accomplished primarily by the use of posthypnotic suggestions; i.e., suggestions given in the hypnotic state but to be carried out after the hypnosis has been formally terminated.

But how does one get a person into the frame of mind in which he is more receptive and cooperative than he usually is? This brings us to the so-called "methods of hypnotic induction." These are strictly empirical procedures in the sense that we know they work but are not too certain about how or why they work. The various methods all use the same general principles, and are usually composed of simple muscular exercises together with talk on the part of the hypnotist. Any physician can learn these techniques, and they probably should be taught, together with the principles involved, to medical students as a regular part of their training. In addition, the student should

have a background of knowledge of human behavior and especially of its motivation.

Even if some of these students never used hypnosis formally in their practice, the study of it would impress upon them most vividly the principle that ideas are the most powerful instigators of the behavior with which they have to deal during every day of their practice. This, in a nutshell, is the secret of medical hypnosis: Implant an idea in the mind of the patient in such a way that the patient will not resist the idea, and the action indicated by the idea will almost inevitably occur.

WILLIAM T. HERON
University of Minnesota

WORKING WITH SPACE IN THE PROFESSIONAL OFFICE

An article in a late issue of a leading building trade publication talks about a "ripe, new market" for commercial buildings having a residential appearance . . . professional office buildings.

This development is undoubtedly due, in large part, to the move to the suburbs we hear so much about. While there will most certainly always be a need for downtown doctors' offices, a suburban location has much to offer: proximity to patients, ample parking facilities, quiet surroundings, lower building costs, and the possibility of renting out office and examining room space to other professionals.

In planning for a new, suburban type office of this nature, the architect or builder will require help in arranging the floor plan or layout that will be best suited to the individual doctor's needs. The location of heavier equipment, dressing rooms, reception areas, office space, heating equipment, all have important bearings on the layout, and on construction costs as well.

Typically, a long corridor will run the length of the building from the reception area to the back wall. Rooms serving the purposes outlined above are then economically arranged on either side of the corridor. The major drawback to this arrangement, oddly enough, is rarely disclosed until it is too late—door-swing space.

Obviously, doors cannot be permitted to open outward into the corridor without excessive hazard to people passing through. On the other hand, doors that open into the rooms effectively waste large areas of floor and wall space—forcing unsatisfactory furnishing arrangements inside the rooms, or necessitating larger rooms and consequently higher building and maintenance costs.

A simple way out of this quandary is the use of accordion folding interior doors. These doors fold open and closed entirely within the doorway, so that tables, chairs, equipment or cabinets can be located immediately on either side of them within the room itself.

* * *

Some of the more obvious methods of effectively utilizing available space are the use of built-ins, cabinets, and storage walls. For example, in little more area than normally used by a desk, a counter can be built to close off the receptionist's area. The counter can serve efficiently as both a desk and storage for all records, eliminating the need for separate filing cabinets . . . and usually at a lower cost than a desk and filing cabinets combined.

Built-in cabinets similar to those found in home kitchens are also efficient space-savers, and permit utilization of all the space along the floor and wall of a room—right up to the ceiling! Too often, a heavy-laden, free-standing cabinet (that looks like an old dresser painted white) is permitted to occupy a dominant position against an otherwise blank wall, while the doctor searches hopelessly for a place to store an extra "Band-Aid."

If there is need for an extra room every day, facilities are obviously just too inadequate for one's business. On the other hand, if the need arises only occasionally, and doesn't justify the cost of additional construction or moving to new quarters, there are other possible solutions.

Free-standing, folding screens can be used to good advantage where complete privacy—including both sound and sight—is unimportant. They are quite flexible in that they can be moved to any part of a room, or from one room to another, if necessary. Their flexibility, however, creates problems of handling, and of storage when not in use. In addition, they tend to get battered and soiled from handling, and require frequent washing, and relatively frequent painting to keep them looking at their best. Under these circumstances, they seem best suited for only the most infrequent use.

Where maximum privacy, and flexibility of a permanent nature are indicated, an accordion folding door (called room dividers or movable

walls in floor to ceiling sizes) would present an ideal solution. Folding room dividers operate in tracks fastened to the ceiling—in their "stacked" or folded position, they rest compactly out of the way against the wall—and with very little effort, they can be extended across the room to form two separate rooms in a matter of seconds.

Since the track must be permanently secured to the ceiling, the path of the door remains fixed. On the other hand, storage and handling problems are eliminated, and maintenance—except for an occasional washing, as with permanent walls—is non-existant. Perfect sight privacy is obtained, along with partial sound privacy; and where sound privacy approaching fixed wall construction is required, special sound insulating liners can be built into the door. The sound liner is installed between the steel frame and the vinyl-coated fabric cover of the door, and does not affect its appearance or operation.

In other words, folding doors literally provide the professional office with a movable wall that quickly and easily provides an "extra" room when it's needed, or folds out of the way for normal activities.

J. D. KENISON

CONVERSION HYSTERIA AND PSYCHOSOMATIC DISORDER

There is a persistently high incidence of physical symptoms due to emotional disturbance and without related ascertainable structural lesions. In rural areas, these symptoms often continue to assume the forms described by Charcot† in the last decades of the nineteenth century in Paris, whereas in urban areas unresolved emotional tension often finds discharge through the autonomic nervous system with excessive stimulation of innervated visceral structures and symptoms resulting from this. The physical symptoms described by Charcot, the gross paralytic, spasmodic and convulsive motor disturbances, the exaggeration or loss of sensation, sometimes blindness, deafness or mutism, were studied by Freud intensively. He showed that these symptoms were substitutes for ideational and feeling representation in consciousness of frustrated sexual wishes and fantasies which could not be acknowledged by the patients because of their conflicting with inner unconscious and conscious forces related to conscience. Indeed the symptoms also represented indirectly these repressive forces of conscience, causing great pain and suffering in consequence.

Freud* found ways to enable memories connected with repressed wishes and fantasies to achieve conscious recognition, simultaneously affording an outlet for strangulated affects through speech. The emotional tension was thus relieved in the psychotherapy, and the symptoms subsided in the process.

Freud later discovered that the memories related to the symptoms were themselves related to experiences dating back to childhood. These childhood experiences were reported to Freud as sexual seductions by adults. Freud came to realize that very often such events had not really occurred. What was reported as an experience was often, though not always, a childhood fantasy of something strongly wished and deeply feared, or an extravagant childhood fantasy based on an early experience. In evolving his concepts of hysteria, Freud came to the view that in all its protean forms it was related to the climax of the early family drama, the so-called oedipus situation, or more concretely to the child's struggle to surmount incestuous genital and hostile strivings of early family life. The symptoms were then understood at a deeper level as substitutes for ideational representation of these strivings, and could be translated back into word language with accompanying affective expression. At the same time, Freud emphasized that the symptoms indirectly represent (or symbolize) the defensive force in conflict with the derivatives of instinctual impulses and the retribution or punishment for forbidden wishes.

Some conversion symptoms, in conformity with this basic focus in underlying psychopathology, represent a materialization of unconscious fantasies concerned with forbidden sexual wishes. Genitalization may consist of tissue changes, including hyperemia and swelling, representing erection; of muscle spasms, representing the movements of coitus, or of sensations resembling genital sensations, although these are often complicated by the perception of pain. On the other hand, as, for example, in convulsive attacks, the symptoms

†Charcot, G. M.: Lecons sur les Maladies du Systeme Nerveux. Paris, 1873.

*Freud, S.: My views on the part played by sexuality in the aetiology of the neuroses. Collected Papers, 1:272-283, 1905.

may represent the reactive rage due to frustration of sexual wishes.

Marmor‡ has recently emphasized that in many cases of hysteria, fixations in the oedipal period are themselves the outgrowth of pre-oedipal fixations, chiefly of an oral nature. He writes:

"The kind of parent who keeps a child at an 'oral level' is apt to be the kind of parent whose behavior favors the development of a strong oedipus complex. The pre-oedipal history of most of the hysterics I have seen has revealed one of two things, either intense frustration of their oral-receptive needs as a consequence of early defection or rejection by one or both parent figures, or excessive gratification of these needs by one or both parent figures."

In recent years the influence of the early mother-child relationship upon ego-development has received increasing attention, especially in respect to the development of an adaptability in adult life which obviates the need for neurotic regression. It is important to realize that, for example, the predisposition to hysteria is built up very largely from undue emotional attachment to one or both parents with difficulty in later displacement of this attachment to a suitable human partner.

We live in an era of considerable cultural change including a wider dissemination of education, a decrease in prudery and secrecy about sex and an increase in understanding that physical symptoms can result from emotional disturbance. Now often somatic and physiologic expressions of emotional disturbance seek deeper and more disguised avenues of discharge. For when the attempted symbolic resolution of an emotional conflict in body-language begins to communicate as much, or nearly as much, as word-language to the patient himself as well as to those in his particular life-space, the attempt may immediately become abortive. The unresolved tension may then later result in discharge through the autonomic nervous system with excessive stimulation of innervated visceral structures. In this way, an increased incidence of psychophysiologic disorder may occur in the urban population, replacing the classic forms of neurosis prevalent in the time of Charcot in Paris.

Classic forms of hysteria continue in heavy incidence, however, in the rural areas of this country. Examination of such instances of classic hysteria often reveals that the familial style of life, including sleeping arrangements, results in the relatively frequent early observation by the children of sexual scenes between the adults. This "primal scene" exposure is associated with heightened difficulty in surmounting the oedipus complex, and a later vulnerability to frustration so that major classical hysterical attacks occur§.

While Freud's work on the meaning of hysteria, together with the work of other medical pioneers such as Havelock Ellis, led to less prudery and hypocrisy about sex, the work had other important lessons for mental hygiene. In particular, it became evident that early exposure to sexual scenes, or for that matter to sexual instruction, before readiness had developed for this in the developing ego, led to damaging rather than helpful effects. Premature sexual excitation stimulated by adult behavior can have a traumatic effect, and can establish the soil out of which further emotional excitation in later years yields more or less intensive morbid phenomena. It would nowadays seem necessary to bring these possibilities to the notice of "enlightened" parents, some of whom are overanxiously permissive about the curiosity of their children. It also is indicative of the need to improve the housing conditions of the less educated, and less sublimated, members of the community. These are important aspects of the promotion of healthy development of children and the prophylaxis of adult neurosis.

D. Wilfred Abse, M.D.

‡Marmor, G.: Orality in the hysterical personality. J. Am. Psychoan., 1:656-671 (Oct.) 1953.

§Abse, D. W.: The diagnosis of hysteria. John Wright, Williams and Wilkins, 1950.

AMERICAN GOITER ASSOCIATION OFFERS VAN METER PRIZE AWARD

The American Goiter Association is again offering the Van Meter Prize Award of $300.00 to the essayist submitting the best manuscript of original and unpublished work concerning "Goiter—Especially its basic cause." Studies may relate to any aspect of the thyroid gland in all of its functions in health and disease. The Award will be presented at the Fourth International Goiter Conference, London, England, July 5-9, 1960. A place on the program will be reserved for the winner if he can be present at the meeting. For 1960, the recipient of the Award will receive consideration for an award of a travel honorarium.

The competing essays should not exceed 3,000 words in length, must be presented in English, and may cover either clinical or research investigations. Duplicate typewritten copies, double spaced, should be sent to Secretary, Dr. John C. McClintock, 149½ Washington Avenue, Albany 10, New York, before January 1, 1960.

President's Letter

CLOSED PANEL PLANS VERSUS FREE CHOICE OF PHYSICIAN

In recent action taken by the AMA House of Delegates in Atlantic City, New Jersey, the recommendations presented in the report of the Commission on Medical Care Plans were modified and adopted. Reaction to the AMA action was immediate and varied. "AMA does about face," and "After years of bitter opposition to closed panel health care plans, the AMA has made a significant modification of its position" were but two of the many editorial observations. The tone of most of these comments would make it appear that the medical profession has finally accepted as inevitable, closed panel medical practice.

The following statement, dealing with the definition of free choice of physician, was adopted by the AMA House of Delegates.

"The American Medical Association believes that free choice of physician is the right of every individual and one which he should be free to exercise as he chooses. Each individual should be accorded the privilege to select and change his physician at will or to select his preferred system of medical care and the American Medical Association vigorously supports the right of the individual to choose between these alternatives."

The AMA House pointed out the significance of free choice as follows.

" 'Free Choice of Physician' is an important factor in the provision of good medical care. In order that the principle of 'free choice of physician' be maintained and be fully implemented, the medical profession should discharge more vigorously its self-imposed responsibility for assuring the competency of physicians' services and their provision at a cost which people can afford."

Minnesota's position on free choice was made clear in the majority report of the Committee on Medical Care Plans presented by Chairman Herbert Plass, M.D., at the recent 106th Annual Meeting of the Minnesota State Medical Association.

The report emphasized that "the Minnesota State Medical Association emphasize its stand strongly, upholding the free choice of physician as a concept to be considered as a functional principle to the best medical care." The Minnesota recommendations further stated in part:

"We would like to emphasize strongly that we are opposed to so-called 'closed panel plans' which limit the free choice of physician. We are cognizant of the fact that in certain areas these plans are operating successfully to fulfill an apparent need. In these areas, the 'free choice of physician' has been necessarily jeopardized. Nevertheless, it is our opinion that alternative plans can be developed through the cooperation of medical societies and the individuals involved which will obviate the need for these so-called 'closed panel plans.' Furthermore, we would like to re-emphasize the inherent danger to the future quality of medical care which is likely to be associated with the further development and spread of these closed panel plans."

What will be the future of closed panel medical practice and the free choice of physician as it presently exists in light of these recent state and national actions? Have the pending implications of these actions been correctly interpreted by outside observers who can see what we of the medical profession are unable to sense? Only time will tell.

Benjamin B. Foulston M.D.

President, *Minnesota State Medical Association*

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

THE DOCTOR'S PLAN—VOLUNTARY HEALTH INSURANCE EXPLAINED

The following is the text of an address, "The Doctor's Plan—Voluntary Health Insurance," presented by L. A. Orsini, Vice Chairman of the Health Insurance Council, at the April 6, 1959, meeting of the Hennepin County Medical Society in Minneapolis.

* * *

Through the stimulation of competition and the demands of various consumer groups the overall pattern of financing medical care is today enmeshed in a process of evolution. It is understandably difficult for the practicing physician to stay abreast of this rapidly changing picture with the numerous other demands on his time flowing from the desire and need to provide his patients with the best medical care.

The growth of voluntary health insurance and its distribution among different types of insuring organizations clearly demonstrates that the public wants the high quality medical care which modern medicine offers and has confidence in the ability and ingenuity of the voluntary system to develop the most economic and effective methods of financing such care.

This confidence and support has been developed through a system which has preserved for the public the right to choose whether or not to buy insurance. It has stimulated experimentation in insurance coverage design which assures the individual of a wide choice of alternatives in selecting those coverages which best fit his needs or circumstances and assures continued progress in our efforts to offer broad coverage at reasonable cost. This is being accomplished for the most part in a manner which recognizes and strengthens present concepts of the free practice of medicine.

The issues are clear, the relationships of health insurance to the financing of medical care is firmly established, the question we face is whether the ultimate answer will be provided through the continued expansion and growth of the voluntary system or a government operated program. It is apparent therefore, that on this point we stand or fall together. Since our destinies are at stake, I want to discuss with you some of the responsibilities we must assume to influence the public's choice.

First let's look at where we are with respect to the two main criteria used to evaluate our voluntary health insurance system:

1. Making coverage available to all who want and can afford to buy it.
2. Providing broad coverage at reasonable cost.

Today about seven out of ten persons have some form of health insurance. The true significance of this accomplishment is apparent when we recognize that the remaining 30 per cent is made up, in part, of those who do not need, want, or believe in (for religious or other reasons) health insurance; and others who are institutionalized in government financed mental, chronic illness or tuberculosis hospitals or receive care from the Veteran's Administration, Medicare and other government sponsored programs. Furthermore, additional progress seems assured in this area with the development of new methods for extending the economics of group insurance to more people and extending coverage to physically impaired risks and our senior citizens.

Obviously, the problem of financing hospital and medical care for the retired aged is a subject of real concern, not only because of its social significance, but also because it is the point on which the survival of our entire voluntary system of providing and financing health care may ultimately be resolved.

It is important that any evaluation of the potential of voluntary health insurance in meeting this problem be carried out objectively and dispassionately with a full realization of the fundamental superiority of a private operated system over similar government programs.

Here are some of the important facts:

1. *What is being done?*

Seven principal methods are being employed to provide health insurance to older persons. They are: (a) Continuation of insurance on older active workers under group insurance plans. (b) Continuation of group insurance on workers who retire and their dependents, generally with part or all of the premium paid by the employer. (c) Continuation on an individual policy or contract basis, of coverage originally provided by group

insurance, this being accomplished by conversion of the group coverage on termination of employment or membership in the insured group. (d) New issuance of group insurance on such groups of older people as associations of retired persons or employees, retired teachers and civil servants and Golden Age Clubs. (e) Continuation into the later years of individual insurance purchased at the younger ages. (f) New issuance of individual insurance at advanced ages. (g) Issuance of insurance that becomes paid up at age sixty-five, thus enabling the policyholder to pay for his protection during his productive years.

2. *What is the current status?*

The number of older people having some form of health insurance today is not known precisely. Generally, it is accepted that at least 40 per cent of the persons over sixty-five now have some form of health insurance.

It is also important to recognize that about 16 per cent of the aged are public welfare recipients under the federally aided public assistance programs and as such are eligible to receive health care. This group is and should be government's responsibility.

3. *What progress has been made?*

For the ten-year period (1946-1956) the population in the sixty-five to sixty-nine age bracket covered by hospital expense insurance increased from 15 to 48 per cent; in the seventy and over bracket, the increase was from 5 to 30 per cent. Furthermore, I believe you find that current figures support a trend of continued progress. This stems from the increased awareness of both management and labor of the need to continue health insurance protection after retirement and the development of new coverages and techniques through which the individual may acquire coverage at the older ages. This assumption is re-enforced by the fact that recent studies have shown that coverage for the aged has been increasing at the rate of about 3 per cent per year.

4. *What are some of the recent significant developments in this area?*

Certainly the action of the American Medical Association at its Clinical Session here in Minneapolis last December is a development of great significance and potential. As you know, this resolution has placed in your hands the initiative for encouraging the development of ". . . effective voluntary health insurance for the group over sixty-five with modest resources. . . ."

It is vitally important that the conditions under which this principle is implemented recognize the need to preserve the public's freedom to choose the type of insurance protection, if any, it wishes to have with adequate information to make that choice intelligently. Thus, medicine should not endorse any single mechanism as the exclusive instrument for providing financial protection to the aged.

I believe you should carefully consider whether in the final analysis the most effective contribution you can make in this critical area is the identification of average fee levels for persons of defined modest resources which would apply irrespective of the source of financing whether it be earnings, savings or insurance or any combination thereof. One thing is clear, this is an area in which there is an urgent need for us to work together.

The complex and rapidly changing patterns of medical and hospital care with their accompanying increased cost are influencing the design of health insurance. While the bulk of the insurance in force today still conforms to the basic hospital surgical and medical care approach a need has clearly emerged for broader coverage at a reasonable cost. This objective is brought into sharper focus by a definition of the terms "broad coverage" and "reasonable cost."

There are many variations in such definitions, however, with the insurance industry, there is general agreement in that:

1. The plan should cover virtually all types of medical, hospital and other expenses which may be encountered during the course of an illness, in recognition of the wide range of technical skills, medical techniques, and expensive drugs involved in modern medicine.

2. The plan should recognize and support those concepts within medicine which have enabled the public to enjoy the finest medical care. This is accomplished by—(a) Encouraging free choice of physician. (b) Embracing quality standards of medical care developed by doctors and hospitals. (c) Recognizing the right of the physician to determine the cost of his service and the type and amount of care needed.

3. The plan should require the insured to share in the total expenses so that premium costs might be maintained at a reasonable level. This is done through deductibles and coinsurance provisions on the assumption that the former will operate to screen out the smaller expenses leaving the major portion of the premium dollar to finance the larger expenses which may be such a hardship to the individual. The coinsurance provision requires the continued financial participation of the insured in his medical care bill (generally 20 per cent) to work against pressures for luxury accommodations or other unnecessary services which would otherwise unnecessarily inflate premium costs.

As you know "Major Medical Coverages" have generally embraced all of the principles previously cited. It is unique in this respect as well as in the fact that it has imposed new responsibilities on doctors, hospitals and the insurance carriers to exercise leadership in making such insurance arrangements work most economically and effectively for the public.

The increasing cost of medical care is receiving increased public attention. Unfortunately, much of the national publicity in this area has incorrectly identified such increases with alleged inefficiency and waste, creating confusion and misunderstand-

ing and jeopardizing the public's acceptance of our voluntary system. Furthermore it is not generally realized that for the most part the increased cost of medical care can be identified with the better health that comes to us all as a result of advances in medical science. Economic inflation is another important contributing factor but it is one over which we have no direct control. Nevertheless, we should not overlook the need to assure the public that we are aware of wasteful practices and that we are taking aggressive steps to eliminate them. Here too, it must be recognized that this responsibility is jointly shared by the doctor, hospital, insured public and the insuring organization, and that the answer rests with the ability of all parties to work together with a full recognition of their relative responsibilities and a willingness to deal with them forthrightly.

To effectively meet this problem I would propose that representatives of the medical profession, hospitals and insurers seize the initiative and jointly develop a plan to (a) identify such practices as overcharging, inefficient use of insured services and other wasteful practices. (In this respect, I am confident that facts will show that problem has been grossly overemphasized by the negative publicity to date); (b) establish such machinery as may be necessary to correct specific cases involved; (c) promote a series of educational programs in cooperation with labor and industry in your area to bring about a better understanding of insurance and what is being done to make the voluntary system work better for the public.

I would like to touch briefly on the subject which has been the number one irritant to the medical profession, namely, claim forms. The insurance industry in cooperation with medicine has developed a set of simplified claim forms through which we hope to streamline the form completion responsibilities you have assumed. We are promoting the widespread use of these forms both within the insurance industry and the medical profession. Recently a booklet describing this program was directed to your attention. This program is already receiving the support of insurance companies writing 80 per cent of the group business and 50 per cent of the individual business. Much progress has been made and more will come with your co-operation, patients and understanding.

In retrospect, you will note that several times in my discussion this evening I have focused the need for co-operation between insurance and medicine. In recognition of this need the insurance industry, through the Health Insurance Council, has established a network of state committees made up of knowledgeable capable insurance company representatives. The Chairman of your Minnesota Committee is here tonight. I know he joins me in the hope that you will look to this committee as your primary contact with the health insurance industry and as the forum through which problems will be resolved and a climate of mutual respect and understanding will be developed.

REPAIR OF LARGE HERNIAL DEFECTS

(Continued from Page 925)

11. Throckmorton, T. D.: Tantalum gauze in repair of hernias complicated by tissue deficiency: Preliminary report. Surgery, 23:32-46 (Jan.) 1948.
12. Koontz, A. R.: Preliminary report on the use of tantalum mesh in the repair of ventral hernias. Ann. Surg., 127:1079-1085 (May) 1948.
13. Lam, C. R.; Szilagyi, D. E.; and Puppendahl, Magda: Tantalum gauze in the repair of large postoperative ventral hernias. Arch. Surg., 57:234-244 (Aug.) 1948.
14. Cumberland, V. H.: A preliminary report on the use of prefabricated nylon weave in the repair of ventral hernia. M. J. Australia, 1:143-144 (Feb. 2) 1952.
15. Burton, C. C.: Classification and technique of fascial sutures in the repair of inguinal hernia. Surgery, 41:823-841 (May) 1957.
16. Moloney, G. E.: Results of nylon-darn repairs of herniae. Lancet, 1:273-278 (Feb. 8) 1958.
17. Uihlein, Alfred: Use of the cutis graft in plastic operations. Arch. Surg., 38:118-130 (Jan.) 1939.
18. ReMine, W. H., and White, R. A.: Results of repair of large ventral hernias with tantalum mesh. Am. J. Surg., 93:1008-1017 (June) 1957.
19. Hultengren, N., and Lindholm, A.: Is the insertion of tantalum mesh advisable in the repair of ventral hernia? Acta chir. scandinav., 111:108-112, 1956.
20. Horwich, Martin: Hernia repair using nylon tricot implant. Brit. J. Surg., 45:320-322 (Jan.) 1958.
21. Abrahams, J. I., and Jonassen, O. T.: The use of polyvinyl sponge in the repair of abdominal wall hernias. Surgery, 42:336-341 (Aug.) 1957.
22. Mayo, C. W., and Keeley, J. K.: Repair of inguinal hernia with external oblique fascia: Critical evaluation of results. Surg., Gynec. & Obst., 88:603-608 (May) 1949.
23. Maier, R. L.: The use and abuse of inert materials in hernia repair. (Editorial.) Am. J. Surg., 94:1 (July) 1957.
24. Poth, E. J.: Discussion. Am. Surgeon, 23:271 (Mar.) 1957.
25. McVay: Quoted by Coley, B. L.: Inguinal hernia. *In* Christopher, Frederick: A Textbook of Surgery. Ed. 6. pp. 1198-1200. Philadelphia: W. B. Saunders Company, 1956.
26. Mayo, C. H., and Mayo, W. J.: Aphorisms of Dr. Charles Horace Mayo, 1865-1939, and Dr. William James Mayo, 1861-1939. (Collected by F. A. Willius.) Springfield: Charles C Thomas, 1951.

American Medical Association

Resume of 108th Annual Meeting

President Dwight D. Eisenhower, speaking at the Presidential Inauguration ceremony of the 108th Annual Meeting of the AMA held June 8-12 in Atlantic City, New Jersey, urged American physicians to protect the "private arrangement between doctor and patient" without which "we shall all have suffered a great loss."

Speaking at the occasion at which Doctor Louis M. Orr, Orlando, Florida, became the 113th president of the American Medical Association, President Eisenhower warned that inflation posed the greatest danger to the traditional free enterprise practice of medicine. He said, "The cost of inflation is not paid in dollars alone, but in increasingly stagnated progress, lost opportunities, and eventually, if unchecked, in lost freedoms for the doctor and the patient."

Mr. Eisenhower told the over-flow group of 5,000 persons assembled in the Convention Hall, that he was "indeed gratified" to learn of medical leadership in meeting the health problems of the aged. The chief executive also noted that the AMA has "embarked upon an all-inclusive program to re-orient our thinking about the place of elder citizens in modern society and to help them meet their health care needs."

"In health as elsewhere in American life," he said, "our summons to greatness calls for a lively partnership of individual effort with action by voluntary agencies and private enterprise and, where necessary, government action at appropriate levels."

Special concern was expressed by Mr. Eisenhower regarding unchecked inflation and its relationship to older people who live, to a great extent, on fixed retirement incomes as represented by pension, insurance policies, and savings. Commenting on this matter, the President said "to this group, inflation is not merely a threat—it is a robber and a thief. It takes the bread out of their mouths, the clothes off their backs, and it limits their access to the medical care and facilities they need."

Doctor Orr Becomes 113th President

Doctor Orr, in his inaugural address, re-affirmed his belief in the basic principles of medicine, democracy and faith unto which America's physicians live today. He pointed out that physicians as citizens, believe in individual freedom, rights and responsibilities.

According to Doctor Orr, "the basic element of progress is not compulsion but voluntary cooperation; not force but reason; not blind obedience but independent intelligence; not timidity but faith—in man, in ourselves and in God."

Dr. Orr pointed out that freedom must continually be fought for by men and women who are willing to stand up and be counted.

The new AMA President particularly stressed the importance of caring for the older citizen. We must "improve and broaden voluntary health programs in preference to compulsory programs that lead to waste," concluded Doctor Orr.

He reminded the audience that they must "defend the unfettered, inquiring mind, for medical progress depends upon the relentless quest for truth by minds that are free."

Actions of AMA House of Delegates Reviewed

Dr. Gunnar Gundersen, La Crosse, Wisconsin, retiring AMA President, told the delegates in his President's Report, that we must be ready to deliver "1959 medicine" intelligently and skillfully. He noted that it is the personal responsibility of every physician to keep abreast of medical advancements.

Doctor Gundersen said physicians must do their "homework" to be prepared for any medical situation by reading scientific journals, attending scientific meetings, participating in the graduate and refresher courses and utilizing every other mechanism of professional education.

In commenting on AMA efforts to advance scientific medicine, Doctor Gundersen pointed out that fifteen of the nation's top scientists will form an *ad hoc* committee to objectively evaluate and advise on the Association's future programs. He pointed out that as a result of the recent AMA progress, he had come to believe that the Association is better prepared to serve both the public and the profession than ever before.

Doctor Gundersen expressed enthusiasm regarding recent developments in the field of health insurance for senior citizens. Blue Shield plans, he said, immediately responded to AMA's call for development of low cost medical coverage for people over sixty-five. He further pointed out that the AMA is expanding its working liaison with all insurance groups through the Health Insurance Council.

Doctor Gundersen strongly emphasized that the medical profession and the insurance industry must cooperate closely in creating plans that best serve the medical and economic needs of the public. Physicians must adhere to the principle of

charging for professional service on a basis that permits the insurance industry to sell health insurance at a price people can afford to pay.

In conclusion, the retiring AMA President commended the campaign against food faddism, and praised the Food and Drug Administration and the National Better Business Bureau for their cooperative efforts in this project.

Commission on Medical Care Plans

The House of Delegates received Part I of the report of the Commission on Medical Care Plans as information only and then acted upon the Commission recommendations item by item. The House adopted thirty-six of the recommendations without change, but reworded three which relate to miscellaneous and unclassified plans. The changed recommendations now read as follows:

B-4. In an effort to decrease, or at least to prevent an increase, in the over-all cost of health care, study should be given to the removal of the requirement of hospital admission as the only condition under which payment of certain benefits will be made.

B-6. Medical care plans should be encouraged to increase their efforts to provide health education and information concerning the coverage of their subscribers.

B-16. The American Medical Association believes that free choice of physician is the right of every individual and one which he should be free to exercise as he chooses. Each individual should be accorded the privilege to select and change his physician at will or to select his preferred system of medical care and the American Medical Association vigorously supports the right of the individual to choose between these alternatives.

In connection with free choice of physician, the House also requested the Board of Trustees to transmit to all constituent medical associations the "far-reaching significance" of Recommendation A-7, which says:

"Free choice of physician" is an important factor in the provision of good medical care. In order that the principle of "free choice of physician" be maintained and be fully implemented, the medical profession should discharge more vigorously its self-imposed responsibility for assuring the competency of physicians' services and their provision at a cost which people can afford.

The House also strongly endorsed Recommendation B-11, which declares:

Those who receive medical care benefits as a result of collective bargaining should have the widest possible choice from among medical care plans for the provision of such care.

Many of the Commission recommendations urged increased activity by state and county medical societies and the American Medical Association in such fields as continuing study and liaison, closer attention to legal and legislative factors, and the development of guides for the relationship between the medical profession and the various types of third parties. To carry out three of the recommendations involving AMA activities, the House also approved a seven-point program which it requested the Board of Trustees to transmit to the Division of Socio-Economic Activities for immediate attention.

Medicine and Osteopathy

In considering a special report of the Judicial Council on the subject of osteopathy, the House adopted the following policy statement regarding interprofessional relations:

(A) All voluntary professional associations between doctors of medicine and those who practice a system of healing not based on scientific principles are unethical.

(B) Enactment of medical practice acts requiring all who practice as physicians and surgeons to meet the same qualifications, take the same examinations and graduate from schools approved by the same agency should be encouraged by the constituent associations.

(C) It shall not be considered contrary to the Principles of Medical Ethics for doctors of medicine to teach students in an osteopathic college which is in the process of being converted into an approved medical school under the supervision of the AMA Council on Medical Education and Hospitals.

(D) A liaison committee be appointed by the Board of Trustees of the American Medical Association to meet with representatives of the American Osteopathic Association, if mutually agreeable, to consider problems of common concern including inter-professional relationships on a national level.

In another action concerning osteopathy, the House recommended that the American Medical Association representatives on the Joint Commission for the Accreditation of Hospitals suggest to the Joint Commission that they inspect upon request and consider for accreditation without prejudice those hospitals required by law to admit osteopathic physicians to their staff.

Preparation for General Practice

The House approved and commended the final report of the Committee on Preparation for General Practice, which proposes a new two-year internship program for medical school graduates planning to become family physicians. To avoid unnecessary confusion, the House deleted only one sentence which read: "Indeed, the committee believes that the one year internship actually encourages inadequate preparation for general practice." The Committee on Preparation for General Practice included representatives from the AMA Council on Medical Education and Hospitals, the American Academy of General Practice and the Association of American Medical Colleges.

The suggested program would include a basic minimum of eighteen months hospital training in the diagnostic, therapeutic, psychiatric, preventive and rehabilitative aspects of medicine and pediatrics in a very broad sense, including care of the newborn. A physician then could elect to spend the remaining six months for additional training in other segments of the program. The commit-

tee stated, however, that participants who plan to practice obstetrics would be expected to spend at least four months of the elective period in obstetrical training.

The report declared that "the graduate program of two years in preparation for family practice should be planned and implemented as a unified whole" with a maximum continuity of assignment in specific services. The program also calls for adequate experience in outpatient care and emergency room service.

Social Security

In considering five resolutions on the subject of compulsory Social Security coverage for self-employed physicians, the House disapproved of four and adopted one reaffirming its opposition to the compulsory inclusion of physicians. In so doing, the delegates expressed concern over the possible effects that a change of policy might have on the Association's entire legislative program, particularly with respect to the Forand Bill.

The House also recognized "the apparent growing demand by physicians for economic security" and requested the Board of Trustees to investigate the possibilities of developing group insurance and retirement plans which could be made available to Association members. It accepted a reference committee suggestion that "the American Medical Association continue and expand its educational program to inform its members of the economic, social and moral advantages of economic security obtained within the framework of our free enterprise system rather than through the mechanisms of governmental Social Security."

Miscellaneous Actions

In dealing with a wide variety of other subjects, the House also: Urged all physicians to participate more fully in community activities and *socio-economic matters* in their own communities but agreed that no change should be made at this time in Article II of the Constitution, which states Association objectives;

Approved in principle the aims and objectives of the President's Council on *Youth Fitness* and the Citizens Advisory Committee on the Fitness of American Youth;

Accepted a Board of Trustees recommendation that the *1962 Annual Meeting* be held in Chicago;

Expressed heartfelt thanks to the Committee on *Amphetamines* and Athletes, which has completed its assignment;

Requested the Board of Trustees to study the problems and possibilities of establishing an AMA—sponsored *medical scholarship* and/or loan program;

Approved the inclusion of *Today's Health* as a benefit of dues-paying membership and urged members to make it available to their patients;

Recommended that state medical societies, where advisable, initiate legislative efforts to eliminate *cancer quackery;*

Received a progress report indicating "phenomenal progress" in the field of health insurance coverage for *the aged* since the Minneapolis meeting last December;

Gave a rising vote of thanks to *Dr. Joseph D. McCarthy,* who finished his term as chairman of the Council on Medical Service;

Reaffirmed its full support of the Educational Council for *Foreign Medical Graduates;*

Endorsed the purposes outlined in the initial report of the *Medical Disciplinary Committee;*

Urged every AMA member to give a substantial gift to the *medical schools* through the American Medical Education Foundation; and

Expressed appreciation for the outstanding *disaster medicine* program presented by the United States Army Medical Service on June 6, 1959, in Atlantic City.

Election of Officers

Dr. E. Vincent Askey, Los Angeles, California, Speaker of the House of Delegates since 1955, was named president-elect to succeed Doctor Orr as president at the American Medical Association Annual Meeting in June, 1960, in Miami Beach, Florida.

The following officers were also elected at the Thursday session: Dr. J. Stanley Kenney, New York City, Vice President; Dr. Norman A. Welch, Boston, Massachusetts, Speaker of the House of Delegates; and Dr. Milford O. Rouse, Dallas, Texas, Vice Speaker of the House of Delegates.

Dr. R. B. Robins, Camden, Arkansas, and Dr. Hugh H. Hussey, Jr., Washington, D. C., were re-elected for five-year terms on the Board of Trustees. Also elected to the Board, for the first time, was Dr. Percy E. Hopkins, Chicago, Illinois.

Dr. J. M. Hutcheson, Richmond, Virginia, was re-elected to the Judicial Council. Re-elected to the Council on Medical Education and Hospitals were Dr. Charles T. Stone, Sr., Galveston, Texas, and Dr. W. Andrew Bunten, Cheyenne, Wyoming.

Dr. Willard Wright, Williston, North Dakota, was elected, and Dr. J. Lafe Ludwig, Los Angeles, California, was re-elected to the Council on Medical Service. Dr. William Hyland of Grand Rapids, Michigan, was re-elected to the Council on Constitution and Bylaws.

Minnesota State Medical Association

Highlights of Actions Taken by the House of Delegates

Dr. Clarence Jacobson, surgeon and general practitioner, from Chisholm, was elected President-Elect of the Minnesota State Medical Association at the final session of the House of Delegates held in conjunction with the 106th Annual Meeting. Doctor Jacobson will succeed Dr. Benjamin B. Souster, January 1, 1960.

A native of Duluth, Doctor Jacobson is a 1916 graduate of Duluth Denfield High School. He attended St. Olaf College in Northfield and received his medical education at the University of Minnesota. He entered general practice in Chisholm in 1928 and is currently president of the Adams Clinic.

Doctor Jacobson was one of the leaders instrumental in the formation of the Range County Medical Society. Prior to the organization of that group, he served as president of the Range Division of the St. Louis County Medical Society.

Doctor Jacobson is a member of the American College of Surgeons.

Other officers elected are the following: William G. Macklin, M.D., Willmar, First Vice President; Brian J. McGroarty, M.D., St. Paul, Secretary; Karl W. Anderson, M.D., Minneapolis, Treasurer; Haddon M. Carryer, M.D., Rochester, Speaker of the House of Delegates; John L. Falls, M.D., Red Wing, Vice Speaker of the House of Delegates; J. N. Stickney, M.D., Rochester, Councilor at Large; Walter B. Wells, M.D., Jackson, Second District Councilor; O. J. Campbell, M.D., Minneapolis, and Albert E. Ritt, M.D., St. Paul, delegates to the American Medical Association; C. L. Oppegaard, M.D., Crookston, alternate for Dr. Campbell; and E. M. Hammes, M.D., St. Paul, alternate for Dr. Ritt.

Fifty-Year Members Honored

Fifty-three members of the Minnesota State Medical Association who, in 1959, completed fifty years of medical practice in Minnesota, were honored at the Annual Banquet held in conjunction with the 106th Annual Meeting.

Twenty-seven half-century mark physicians were in attendance to receive their citations. Presentations were made by Dr. Haddon M. Carver, Rochester, Speaker of the House of Delegates.

New members of the Fifty-Club are:

Minneapolis—Archabald L. Arends, M.D.; Clifton A. Boreen, M.D.; Charles N. Brooks, M.D.; Richard R. Cranmer, M.D.; Henry D. Diessner, M.D.; Charles R. Drake, M.D.; George E. Fahr, M.D.; Edgar J. Huenekens, M.D.; Rae T. LaVake, M.D.; Henry P. Linner, M.D.; Daniel MacDonald, M.D.; Stanley R. Maxeiner, M.D.

St. Paul—George A. Earl, M.D.; Edward W. Ostergren, M.D.; Robert B. J. Schock, M.D.; Edward Schons, M.D.; Alex Stewart, M.D.; Harry B. Zimmerman, M.D.

Duluth—Leon A. Barney, M.D., Arthur N. Collins, M.D.; Frank J. Hirschboeck, M.D.; Francis J. Lepak, M.D.; Archibald L. McDonald, M.D.

Rochester—George B. Eusterman, M.D.; Arrah B. Evarts, M.D.; Dorr F. Hallenbeck ,M.D.; Henry W. Meyerding, M.D.

Outlying Minnesota—Almer M. Aanes, M.D., Red Wing; Roy N. Andrews, M.D., Mankato; Clarence S. Bossert, M.D., Mora; Thomas E. Flinn, M.D., Remer; Raymond T. Healy, M.D., Pierz; Garfield E. Hertel, M.D., Austin; Joel T. Holcomb, M.D., Marine-on-St. Croix; Roscoe C. Hunt, M.D., Fairmont; Alphonse F. Kemp, M.D., Mankato; Herbert H. Leibold, M.D., Parkers Prairie; Arthur J. Lewis, M.D., Henning; James H. McClanahan, M.D., White Bear Lake; Melvin S. Nelson, M.D., Granite Falls; Conrad A. Neuman, M.D., Winona; Henry C. Otto, M.D. Frazee; William L. Patterson, M.D., Fergus Falls; Roy A. Peterson, M.D., Vesta; Robert I. Rizer, M.D., Wayzata; Sidney A. Slater, M.D., Worthington; Albert L. Vadheim, M.D., Tyler; L. W. Clark, M.D., Spring Valley; A. G. Sanderson, M.D., Ashby.

Outstate—Hugh Beals, M.D., LaJolla, California; Mary C. Ghostley, M.D., Santa Ana, California; Charles H. Schroder, M.D., Pottstown, Pennsylvania; and Percy T. Watson, M.D., Miami, Florida.

Over Sixty-five Health Insurance

Health insurance for persons over the age of sixty-five, adoption of a relative value study, and approval of an impartial medical testimony plan were among important items of business to receive the attention of the House of Delegates at the 106th Annual Meeting of the Minnesota State Medical Association in Duluth.

The recommendations of the Committee on Medical Service were accepted in general by the Council. The House of Delegates approved the plan for over sixty-five health insurance submitted by the chairman of the Council.

Major provisions of the plan include elimination of the sixty-five year age limit; substitution of a 120-day for the current 180-day period of

hospitalization; a six-month waiting period for pre-existing ailments; diagnostic x-ray to be covered in the doctor's office if followed by hospitalization; income limits of $2,400 for single persons and $3,600 for man and wife; net worth limits for complete service benefits of $20,000 for single persons and $30,000 for man and wife; participating physicians to be paid on the same schedule as is used in the basic Plan A contract; and, finally, an estimated cost to subscribers of about $2.00 a month.

The adoption plan has been forwarded to Minnesota Blue Shield for review and implementation. Remaining to be solved is the matter of providing a matching contract for hospitalization of the aged. Currently negotiations regarding this phase of medical care for the aged are in progress between Minnesota Blue Cross and Minnesota Blue Shield.

Blue Shield Contract Changes Proposed

Two important extensions to the standard Blue Shield contract were also approved by a special "go-ahead" action of the House.

The first provided for an extension to the basic contracts for covering major medical expense, and would become effective after benefits of basic Blue Shield contracts have been exhausted. The proposal also provides for a "corridor". Also included is the "coinsurance feature" which requires the patient to pay a portion of the bill himself.

The other extension would provide out-of-hospital coverage for diagnostic x-ray and diagnostic laboratory services, up to a cost of fifty dollars each for Plan A subscribers and seventy-five dollars each for Plan B subscribers.

The Blue Shield Board had urgently requested immediate action, especially for the major medical expense extension although details were not fully worked out. The Council felt that additional time was needed for essential study before House approval could be recommended for the two plans. For that reason, the Chairman of the Council informed the House of the situation at the Monday session and asked the delegates for authority to approve the plans after proper consideration had been given, and if such action seemed warranted on the basis of such consideration. Acting on the permission of the House, which was unanimously given, the Council has now studied both plans and has approved both of them in principle. Both extensions will be sold, with Council sanction, as soon as details can be worked out and that sanction carries with it the sanction, also of the House of Delegates.

Relative Value Study

The House voted its approval in principle to a relative value study. The study is similar to one adopted in California.

It is important to note that adoption of this study does not mean that the delegates had voted to inaugurate a fee schedule for Minnesota nor does it mean that a standard unit of value was set up to be used as the basis for the schedule.

The relative value study was adopted in order that it may be used as a guide in determining fees. It was also suggested that such a guide might be useful particularly for insurance companies and for physicians who are entering practice.

Impartial Medical Testimony

Unanimously approved, in principle, by the House of Delegates was a method of handling impartial medical testimony in the state of Minnesota. The method approved is called the New York Plan for Impartial Medical Testimony. Later this plan also received approval of the Minnesota Judges Association.

Many details still must be worked out co-operatively by the Medical Advisory Committee, the Minnesota Judges Association and the Minnesota State Bar Association before the plan can be inaugurated.

The method stipulates that medical associations select physicians who are qualified to give expert medical testimony in various fields of medicine. Judges who are disturbed by the quality or the conflict in medical testimony given in their courts or in pre-trial conferences would then look for assistance to panels comprised of these physicians.

By-laws Change

Six amendments to the By-laws were adopted at the Duluth meeting and will be published as adopted in MINNESOTA MEDICINE.

Amendments adopted provide for the territorial jurisdiction of county and district medical societies; with membership for medical missionaries outside the United States and also with residency memberships (one restriction on such membership having been lifted in accordance with action taken by the House last year); the mechanics for proposing amendments to the By-laws; with authority of the House of Delegates to adopt new principles of medical ethics; and with the establishment of new dates on which dues to the Association will become due and delinquent.

Miscellaneous Resolutions

A number of miscellaneous resolutions were also passed. Two provided for definite responsibility of county medical societies in the civil defense program. Another stipulated that more emphasis should be placed on the teaching of medical problems of the aged in the University of Minnesota Medical School.

In another resolution, the essay contest sponsored annually by the Association of Physicians and Surgeons was also approved, provided the county medical societies concerned wish to promote this project in their individual groups. The decision to participate was granted to the individual county society.

The Art of Medicine

PR

Carl H. Woyke, B.A.
Editor

GOOD GUEST SPEAKER RELATIONS ARE IMPORTANT

Is there a guest speaker scheduled for the next medical society meeting? The American Society of Association Executives makes the following suggestions in the interest of good guest speaker relations:

Make your request and make definite arrangements about the fee. If there are expenses involved, tell him quite plainly what expenses you will pay. In your letter or talk include date, time and place, type of speech or subject, length of speech, question or answer period later, type of meeting you're holding, description of your group, type and size of audience, and description of program.

Once the speaker has accepted invitation and confirmed the fee, begin the process of making him feel welcome. Don't wait until the day of his speech. Write another letter and thank him for his acceptance, ask if you can meet him on arrival, ask to make his hotel reservations, give detailed information on how to get to meeting place, send copies of advance program and promotion material, find out what equipment he needs, and tell him who else will be at the speakers' table.

Publicity is important for both of you. Send him data form for publicity information if he doesn't provide it, follow-up with newspaper clippings of any publicity, and obtain his permission if you plan to record or broadcast his speech.

A few days before the meeting send a reminder letter and again welcome him to the meeting.

When speaker arrives, have a note at his hotel telling where to contact you if you haven't met him, arrange to meet with him, as soon as you can, arrange for escort from his room or door of meeting room to the speakers' table, and pay fee immediately before or right after the meeting.

CAN YOU SUGGEST A DOCTOR?

Frequently, the state association office, as well as other county societies and individual physicians, are confronted with this question from someone seeking medical service.

Here's how the San Diego Medical Society handles such requests.

When a patient calls the San Diego County Medical Society for a physician, he is sent two or three choices and a card entitling him to a free get-acquainted visit. The card gives city newcomers and others a chance to *interview a physician at no cost to themselves and discuss the possibility of making him their family doctor.*

Message on the card reads: "The San Diego Medical Society has recommended to the public that every family should have a personal physician. Ordinarily medical fees are not assessed for such an introductory interview unless specific advice and/or treatment is instituted."

CHECKUP OR BRUSHOFF?

This three-word question was asked in the November 2, 1958, issue of the *Wichita Eagle,* Wichita, Kansas. The editorial explanation of the inquiry which accompanied the question is as follows:

We read repeatedly of major public figures going to their doctors for "a regular medical checkup." President Eisenhower did this a few days ago and was found healthy and able to take the rigors of office and campaign.

"But so often when one of us ordinary persons goes to our own doctor for a 'periodic checkup' we get a brushoff instead.

Medical literature and public health officials constantly advise that the best way of preventing disease and ailments is to have such checkups. Like the Cancer Society's admonition, 'Fight Cancer with a Check and a Checkup.'

Many doctors, for reasons of being overloaded with work or for other reasons, don't seem to take this idea seriously. They take the individual's blood pressure, tap his chest to listen, ask if he has any complaints, and then turn him out so they can deal with persons known to be ill.

Doctor Lester Breslow, chronic diseases chief of the California State Health Department, spoke up against this practice in a talk in St. Louis a few days ago. He said that it could be blamed partly on the shortage of doctors.

He added that this is a 'major challenge' to the professors of preventive medicine in our medical schools. And we're inclined to agree. Too many times we have known of someone succumbing to cancer or some other ailment when a thorough physical examination a few months before would have revealed it and allowed time for treatment."

MAKE CERTAIN THAT THERE IS A DOCTOR IN THE HOUSE Has your county medical society ever considered the possibility of volunteering its emergency service to visiting conventioners, or staffing a medical headquarters at your local county fair?

The *PR Doctor* notes that during a recent convention of the Association for Health, Physical Education and Recreation in Portland, Oregon, the Multnomah County Medical Society made its emergency call system available to all conference attendants. Announcement of the service and the telephone number were printed in meeting literature so that visitors to the convention would know how to get a doctor.

Whatever the group, if enough people are gathered, it is a fair assumption that someone is going to need medical attention, adds the *PR Doctor.*

READING RACKS INSTALLED IN DRUG STORES The Medical Society of the State of Pennsylvania has launched a co-operative project with the State Pharmaceutical Association to use drug stores for the distribution of medical public relations material.

When a local pharmaceutical association expresses interest in pamphlet distribution the state medical society dispatches a representative to explain the program to the group. If the druggists agree, each member *is supplied a pamphlet rack and a quantity of pamphlets to display in his drug store.* The society replenishes the supply periodically with up-to-date materials.

The whole operation is carefully *co-ordinated with the state pharmaceutical association.* That organization notifies its county groups of the program through its own publications and relays their interest back to the medical society. The state pharmaceutical association also supplies mailing lists and advises the medical society when to restock the druggists' literature.

Perhaps county medical societies or individual physicians may wish to discuss the possibility of such a project with a local pharmacist. The Minnesota State Medical Association will co-operate to supply appropriate public relations and public health information materials when requested.

A COMMENDABLE MOVE The Mower County Medical Society (Minnesota) has awarded its first four-year scholarship to Richard Curtin, a student in an Austin High School.

Richard, the son of Mr. and Mrs. W. A. Curtin, Austin, will receive four-hundred dollars a year for four years to attend the college of his choice if he maintains a satisfactory average. The scholarship will be awarded annually to an Austin High or Pacelli High School graduate.

Merit will be based on high scholastic attainment, need, character and intention of doing college work in the natural sciences or mathematics.

Applicants must apply in writing to the scholarship committee including Dr. T. E. Barber, Dr. A. D. Fetzek, Dr. F. H. Rosenthal, Park Dougherty and Judge Paul Kimball.

Public Health

TUBERCULIN TESTING IN MINNESOTA—1958

D. S. FLEMING, M.D., M.P.H.,
Minneapolis, Minnesota

Almost twice as many tuberculin tests were reported to the Minnesota Department of Health in 1958 as in 1957. The total of 192,434 compares with 98,900 tests reported in 1957 and 39,414 reported in 1954, the first year the present reporting system was used.

A total of 6,007 (3 per cent) of the 1958 tests were positive, and no significant difference was noted in the percentage of male and female positives. Out of 91,920 males tested, 3,047 readings were positive. The 94,507 female patients tested revealed 2,960 positive readings.

Reports are received in the state health department twice a year from district and county public health nurses and others conducting group tuberculin tests. The greater number of tests reported in 1958 can be attributed to more conscientious reporting rather than to more testing.

The bulk of the 1958 tests were conducted in surveys of 450 schools, six colleges, and 3 communities. Industry, Indian reservations, and nursing homes each accounted for two surveys. A rest home, a migrant workers' clinic, and a practical nurses' training school also participated in the testing program. The total on school testing programs is incomplete because nineteen counties failed to list the number of schools included in their summaries.

A breakdown of test results by age groups shows a rising incidence of positive readings as age increases. Out of 21,965 six-year-olds given tuberculin tests, only 198 (less than 1 per cent) were positive. Of the 34,146 tested in the fifteen to nineteen age group, 1,212 (less than 4 per cent) were positive readings.

Although fewer tests were given to older persons, the percentage of positive readings continued to rise. The 3,001 persons tested in the thirty to thirty-nine age group showed 387 (13 per cent) positive. The 1,890 persons tested in the fifty to fifty-nine age group produced 496 (26 per cent) positive, and 1,111 in the sixty and above group revealed 401 (37 per cent) positive readings.

More tuberculin testing should be done in all age groups, particularly among older persons who are most likely to develop tuberculosis. Last year, 95 per cent of the 105 persons who died of tuberculosis in Minnesota were forty-five years of age or older. The tuberculin test should be a standard procedure in health-screening examinations.

Dr. Fleming is Director of the Division of Disease Prevention and Control, Minnesota Department of Health.

The 1958 figures show a greater percentage of positive readings in male than in female patients over the age of fifteen. This probably can be explained by the fact that men usually have more opportunities for exposure to the disease because of normal occupational contacts or military service.

Very few of the children with positive Mantoux tests have active cases of tuberculosis. The reaction simply means that the child has had contact with someone having an active case of the disease and has been infected. It does not mean he is ill with tuberculosis at present, but he could become ill at some time in his life. He should receive a chest x-ray, and his contacts should be traced to find any active cases.

The tests also can be used as an educational technique. We can inform children and their parents about the use, value, and necessity of the tuberculin test for early case-finding in tuberculosis control and educate them on maintaining good health practices.

Many tuberculin tests are performed each year by physicians in offices, hospitals, and other programs which are not reported to the state health department. Submission of all such reports to the department should be standard procedure.

Method

Tabulation of 192,434 tuberculin tests reported from the State of Minnesota for 1958 compares with 98,900 tests reported in 1957, and 39,414 tests reported in 1954, the first year for which the present reporting system was used. Reports are received in the State Health Department twice a year from district and county public health nurses and others conducting group tuberculin tests. Undoubtedly additional thousands of tuberculin tests are carried out each year by physicians in their offices, in hospitals, and in other programs that

SUMMARY OF GROUP TUBERCULIN TESTS

1958

County	Male			Female			Total Persons Tested	Total Positive	Per Cent Positive
	Neg.	Pos.	% Pos.	Neg.	Pos.	% Pos.			
Aitkin	1401	47	3.25	1376	46	3.23	2870	93	3.24
Anoka	2153	85	3.80	2317	68	2.85	4623	153	3.31
Becker	332	2	.60	339	1	.29	674	3	.45
Beltrami	2042	82	3.86	2276	85	3.60	4485	167	3.72
Benton	353	27	7.11	360	27	6.98	767	54	6.58
Big Stone	523	10	1.88	543	9	1.63	1085	19	1.75
Blue Earth	1585	62	3.76	1840	55	2.90	3542	117	3.30
Brown	955	17	1.75	1080	25	2.26	2077	42	2.02
Carlton	972	13	1.32	981	15	1.51	1981	28	1.41
Carver									
Cass	2530	254	9.12	2571	203	7.32	5558	457	8.22
Chippewa	1711	55	3.11	1761	45	2.49	3572	100	2.80
Chisago	412	27	6.15	346	26	6.99	811	53	6.54
Clay	943	36	3.68	1137	29	2.49	2145	65	3.03
Clearwater									
Cook	424	14	3.20	482	16	3.21	936	30	3.21
Cottonwood									
Crow Wing	1570	40	2.48	1611	48	2.89	3269	88	2.69
Dakota	2707	103	3.67	2459	134	5.17	5403	237	4.39
Dodge	1031	8	.77	1056	17	1.58	2112	25	1.18
Douglas	895	10	1.10	927	20	2.11	1852	30	1.58
Faribault	1556	20	1.27	1541	14	.90	3131	34	1.09
Fillmore	929	14	1.48	935	16	1.68	1894	30	1.58
Freeborn	1097	57	4.94	1216	41	3.26	2411	98	4.06
Goodhue	2868	72	2.45	3173	64	1.98	6177	136	2.20
Grant	255	2	.78	226	0	.00	483	2	.41
Hennepin, Minneapolis C.	3412	193	5.35	3454	215	5.86	7274	408	5.61
Houston									
Hubbard	405	4	.98	367	3	.81	412	7	1.70
Isanti	337	56	14.25	328	34	9.39	755	90	11.92
Itasca	2172	100	4.40	2131	94	4.22	4497	194	4.31
Jackson	644	19	2.87	741	19	2.50	1423	38	2.67
Kanabec	141	0	.00	183	1	.54	325	1	.31
Kandiyohi	3250	22	.67	3201	27	.84	6500	49	.75
Kittson									
Koochiching	848	21	2.42	1414	42	2.88	2325	63	2.71
Lac qui Parle	451	18	3.84	418	18	4.13	905	36	3.98
Lake	630	11	1.72	684	6	.87	1331	17	1.28
Lake of the Woods									
LeSueur									
Lincoln									
Lyon	1030	47	4.36	943	31	3.18	2051	78	3.80
McLeod	1554	6	.38	1552	5	.32	3117	11	.35
Mahnomen	1251	9	.71	1235	8	.64	2503	17	.68
Marshall	729	18	2.41	784	21	2.61	1552	39	2.51
Martin	1175	34	2.81	1190	36	2.94	2435	70	2.87
Meeker	682	7	1.02	700	8	1.13	1397	15	1.07
Mille Lacs	2413	264	9.86	2298	195	7.82	5170	459	8.88
Morrison	2818	30	1.05	455	12	2.57	3315	42	1.27
Mower	450	10	2.17	3028	41	1.34	3529	51	1.45
Murray									
Nicollet	94	12	11.32	99	36	26.67	241	48	19.92
Nobles	1469	51	3.36	1360	42	3.00	2922	93	3.18
Norman	657	23	3.38	529	22	3.99	2110	45	2.13
Olmsted	56	5	8.20	48	1	2.04	110	6	5.45
Otter Tail	667	23	3.33	646	32	4.72	1368	55	4.02
Pennington	694	32	4.41	1286	50	3.74	2062	82	3.98
Pine									
Pipestone	748	31	3.98	820	14	1.68	1613	45	3.79
Polk	1806	40	2.17	1936	72	3.59	3854	112	2.91
Pope	945	20	2.07	837	41	4.67	1843	61	3.31
Ramsey, excl. of St. Paul C.	5160	100	1.90	5565	109	1.92	10934	209	1.91
Red Lake	68	3	4.23	89	1	1.11	161	4	2.48
Redwood	988	177	15.19	1109	144	11.49	2418	321	13.28
Renville	2902	91	3.04	2783	64	2.25	5840	155	2.65
Rice	1916	34	1.74	1820	24	1.30	3794	58	1.53
Rock									
Roseau	705	15	2.08	728	15	2.02	1463	30	2.05
St. Louis, excl. of Duluth C.	2046	40	1.92	2035	29	1.41	4150	69	1.66
Scott	1279	17	1.31	1316	14	1.05	2626	31	1.18
Sherburne	304	8	2.56	355	11	3.01	678	19	2.80
Sibley	1637	7	.43	1620	8	.49	3272	15	.46
Stearns	3242	133	3.94	3323	156	4.48	6854	289	4.22
Steele	973	33	3.28	982	45	4.38	2033	78	3.84
Stevens	543	8	1.45	578	6	1.03	1135	14	1.23
Swift									
Todd	2365	35	1.46	2451	40	1.61	4891	75	1.53
Traverse	228	4	1.72	229	10	4.18	471	14	2.97
Wabasha									
Wadena									
Waseca	803	25	3.02	742	18	2.37	1588	43	2.71
Washington	196	41	17.30	177	4	2.21	418	45	10.77
Watonwan									
Wilkin	777	11	1.40	789	18	2.23	1595	29	1.82
Winona	2723	67	2.40	3637	69	1.86	6496	136	2.09
Wright	441	18	3.92	447	25	5.30	931	43	4.62
Yellow Medicine	1946	24	1.22	2032	28	1.36	4030	52	1.29

SUMMARY OF RESULTS

Type of Tuberculin Used: O.T. and P.P.D.
Strength Used: 1:1000 and Intermediate

Age	Male			Female			Total	Male and Female % Positive
	Negative	Positive	% Positive	Negative	Positive	% Positive		
Under 1	50			36			86	.00
1	92			90	3	3.23	185	1.62
2	149	1	.67	167	1	.60	318	.63
3	177	1	.56	180	4	2.17	362	1.38
4	213	2	.93	205	2	.97	422	.95
5	3321	27	.81	3240	33	1.01	6621	.91
6	11176	89	.79	10591	109	1.02	21965	.90
7	7591	69	.90	7074	81	1.13	14815	1.01
8	6472	74	1.13	6122	82	1.32	12750	1.22
9	6999	100	1.41	6594	105	1.54	13798	1.49
10	6685	126	1.85	6431	120	1.83	13362	1.84
11	7965	196	2.40	7986	180	2.20	16327	2.30
12	6809	169	2.42	6618	152	2.25	13748	2.33
13	5147	155	2.92	5101	141	2.69	10544	2.81
14	7645	264	3.34	8409	214	2.48	16532	2.89
15-19	15523	637	3.94	17411	575	3.20	34146	3.55
20-24	996	69	6.48	1405	84	5.64	2554	5.99
25-29	785	98	11.10	813	63	7.19	1759	9.15
30-39	1269	201	13.67	1345	186	12.15	3001	12.90
40-49	845	196	18.83	1393	217	13.48	2651	15.58
50-59	541	244	31.08	853	252	22.81	1890	26.24
60-above	351	226	39.17	359	175	32.77	1111	36.09
Not stated	1110	103	8.49	2084	181	7.99	3478	8.17
Total	91920	3047	3.21	94507	2960	3.04	192434	3.12

have not been reported. Such reports are welcomed and encouraged in order to increase the value of the data presented.

Testing in 1958 was accomplished in the following situations, according to reports:

Schools	450
Colleges	6
Communities	3
Industries	2
Indian Reservations	2
Nursing Homes	2
Rest Home	1
Migrant Workers Clinic	1
Practical Nurses Training School	1

The predominance of school programs accounts for concentration of tests in the school age groups. Because reports from nineteen counties failed to list the number of schools included in the county summary, the total number of school programs shown above is incomplete.

Testing of communities is carried out when evaluation of the local tuberculosis problem seems to warrant it. Of the three community tests in 1958, one included four townships in which there was an Indian population; one was a single township; and the third was two small neighboring villages.

Old tuberculin has been the material of choice for screening and has been used in 1958 entirely in eighty-nine programs. P.P.D. has been used six times, either for an entire survey or for part of the program. Some counties have two programs a year, one in the fall and one in spring. Different areas usually participate each time.

Appreciation is expressed to all those public health workers of official and voluntary agencies, volunteers, school people, physicians, and all the others in the state who have helped in this program.

AMERICAN MEDICAL ASSOCIATION DECLARES WARNINGS ON ALL HAZARDOUS CHEMICALS NEEDED

Warnings on the labels of all products containing hazardous chemicals were declared recently as the objective of a model law formulated by the American Medical Association and recently introduced into Congress. (H. R. 7352).

Speaking before the Association of Food and Drug Officials of the United States, Hotel Bradford, Boston, Mass., Bernard E. Conley, Ph.D., Chicago, secretary of the A.M.A. Committee on Toxicology, declared "If we are to educate people to read labels and obey their warnings, we must require identification of hazardous ingredients on all products, not merely on certain classes of chemicals such as pesticides."

Half of all substances causing accidental injury and death are not required by law to carry precautionary labeling. Many of these are used in the home, in small businesses and in other areas where control of harmful exposures is not as guarded as in the manufacturing process.

While three-quarters of these products contain substances which are moderately toxic or worse, most states and the federal government have no laws to require them to carry warnings or to declare toxic or other hazardous constituents, Dr. Conley declared.

There has been a growing acceptance of the need to label hazardous household chemicals. Examination of over 1,000 varieties of products revealed that chemicals used in commercial establishments, such as hotels, garages, laundries and restaurants, need the benefit of labeling as greatly as those entering the home.

Dr. Conley discounted the claim that wide use of precautionary labeling would bring about eventual disregard of all warnings. The widespread use of danger and warning signs for transportation and traffic hazards has never been considered a deterrent to safety. No one ever suggested that our mounting motor accident statistics are due to the number of safety signs about them; rather the growing number of auto accidents are related to the increasing number of motor vehicles. The same basic factors underlie the problem of accidental poisoning by hazardous chemicals.

History of Medicine in Minnesota

A MEDICAL HISTORY OF MEEKER COUNTY PRIOR TO 1900

HAROLD E. WILMOT, M.D.

Litchfield, Minnesota

(Continued from April issue)

A Dr. Mumsford, Kimball, Minnesota, signed a death certificate for a patient in Meeker county. This was the first filed record in our present court house.

Dr. Boeckman.—We also find Dr. Boeckman of Saint Paul signing death certificates in 1889 and 1890. I believe it was common to have a consultant such as Dr. Boeckman, or some other prominent physician from the Twin Cities, come to the bedside and assist in care of the case, and, if exodus occurred, he would sign the death certificate.

Dr. Carrol C. Carpenter.—There seems to be a difference of opinion about this doctor. Some thought he had no more license than that of a chiropractor.

In the Minnesota Medical Transcripts four men were licensed as follows:

Albert J.	December 31, 1883	George W.	November 22, 1884
George A.	April 20, 1885	T. S.	January 8, 1885

Inasmuch as we see no C. C. Carpenter listed as a practitioner before 1900, and again inasmuch as Dr. C. C. Carpenter came to our community in 1890, we are compelled to believe that he was not a regular practitioner.

One of our personal acquaintances has already stated that he was probably not a regular practitioner. Another of our close friends of the older school has stated that in his opinion he was of the chiropractic school, and that his wife left him and they were divorced.

He had an upstairs office and was of quite professional appearance. However, he didn't do very well and went to Minneapolis, but probably returned to Litchfield again after 1900.

News Ledger, October 21, 1914—(An Announcement). "To correct what seems to be a general opinion that I am limiting my practice to some specialty, I wish to make the following statement: I am a graduate of the Minnesota Medical College of 1897; and after being in general practice for ten years, I took four months of resident hospital work in surgery and obstetrics and again resumed general practice today.—Dr. C. C. Carpenter, Litchfield, Minn."

The Old Settler states: "Because of baby cases, he was run out of town."

Dr. Henry E. Cassel.—In the *Dassel News,* January 31, 1888: "Dassel has a new doctor, one Cassel by name, but of his efficiency we know nothing." On July 12, 1888: "Dr. Cassel has located in Cokato."

After moving to Cokato he made weekly visits to Dassel. His address given on a death certificate filed in 1889 was Cokato. He moved to Litchfield apparently in

the early spring of 1899. His professional card first appeared in the *Independent,* April 11, 1899, and read as follows:

"Dr. Cassel
Scandinavian Physician and Surgeon
Calls answered promptly day or night
Office over Johnson, Larson and Wanvig's store
Will be absent in the East until May 5th"

Independent, April 18, 1899—"Dr. Cassel left Wednesday for New York to be gone until May 5. He goes to get pointers on anything that is new in the practice of medicine."

Independent, May 15, 1888—"He was elected to be county Democratic delegate to the State Democratic Convention."

Independent, December 28, 1897—"Dr. Cassel is making no progress toward recovering from his mental troubles according to advices received from the Fergus Falls Hospital. He is continually writing letters, and these show plainly his unsoundness of mind."

Rumor has it that his medical difficulties were caused by grief over being refused in marriage. He did, however, recover apparently completely, as he became a very active and famous surgeon during the next decade in Litchfield. Many times he was called in to the Swedish Hospital in Minneapolis to do or assist in doing surgery of very complicated type for the times, sometimes being accompanied by Dr. Karl A. Danielson, residing in Litchfield as his assistant.

Dr. Danielson states that Dr. Cassel was educated in his native country of Sweden, where he had mingled with the aristocracy and nobility and spoke the Swedish language perfectly. He was very popular in the community because of his exceptional ability, as there were other personal characteristics of a derogatory nature.

He weighed well over three hundred pounds, and as a gourmet, glutton, and connoisseur of brandy had no rival other than perhaps the famous Henry VIII of England. He, however, unlike Henry, was only married once; his wife was a Scandinavian nurse from Kingston or Dassel, and she survived him one year, meeting a tragic death when her clothes became saturated with gasoline and were ignited, presumably by herself. She was buried in Ripley cemetery, Litchfield, December 12, 1912.

Many are the tales told of him; due to his enormous size and ready wit and sarcasm, he no doubt will be the outstanding personality in Meeker county's medical history. He employed a driver always, in the horse and buggy days, and many times had to have an entire seat to himself. What a figure this must have presented to the populace! When the automobile came in, he was one of the pioneer owners; and as the steering bar in those days took the place of the present wheel, he had to sit on the opposite side, for there wasn't room for him between the bar and the back of the seat. At one time he overshot a corner in this automobile and it turned over, tipping him on his back in a marsh. He could not extricate himself alone, but soon a passerby assisted him out. He used his characteristic pharse in greeting the helper, "Kristamighty, would you see me drown?"

Another time, while drinking Three Star Hennessey and "Appolinaris Water" after hours with a close friend in the back room of a drug store, the friend, in the hope of getting some free medical advice, kept plying him with the brandy. His keenness being unaffected, he remarked, "Kristamighty, are you trying to drink the doctor drunk?"

When in a grocery store one evening making some purchases, a man approached

him and showed him an infected finger and asked, "What shall I do about this?" His reply: "Vell, I should see a good doctor."

It has been reported that if he had a particularly difficult surgery to do, he did much better by fortifying himself with a half tumbler of brandy just beforehand.

One time in a group of men, one asked him, "Doc, just how much do you weigh?" His answer: "Kristamighty, are you a cattle buyer?"

In the A.M.A. Register of 1884 his name is listed Cassel, Karl H. E., now called Dr. Henry E. Cassel formerly Karl Henry E. *Castle.*

He graduated from the University of Minnesota as M.D. in 1883 and carried Minnesota License No. 597, dated December 31, 1883, by exemption. The Registry further reported that he was licensed in Illinois in 1881; that he was a member of the A.M.A. and director and chief surgeon of the Litchfield Hospital in 1911; and that he died of septicemia due to a needle wound inflicted while doing surgery.

Litchfield Independent, April 4, 1911—"Dr. H. E. Cassel succumbed to blood poisoning at Luther Hospital, St. Cloud, April 4, where he was a patient for the past week. The infection was caused by a slight prick on a finger from one of his surgical instruments about three weeks ago. He would have been fifty-one years old in August."

The burial notes of the Ripley cemetery, Litchfield, show that he was buried there April 7, 1911, and the cause of death given as diabetes.

Dr. Warren B. Robb.—About May 1, 1889, Dr. Robb entered his professional card in the Litchfield papers. He carried the title M.D. and had his office over W. W. Johnson's drug store. He had previously practiced at Long Branch, Minnesota. He was listed in the Official Registry of Physicians of Minnesota as follows: "License No. 816—W. B. Robb—R—2-22-1884—graduated from the College of the City of New York in 1883." His address at the time he received his certificate was Litchfield, but he was a member of the Ramsey county Medical Society October 27, 1884. He joined the M.M.A. in 1885. He was on the registry of St. Joseph's Hospital, Saint Paul, in 1885. Polk's Medical Directory lists him in Saint Paul in 1886 but not in 1890.

Just when he left Litchfield and moved to Grove City, I am unable to ascertain. He signed death certificates in the county in every year consecutively from and including 1891 through 1897 from Grove City. A few notes of his attendance to patients are seen in the Grove City items in the later '90's, and a note of February 11, 1897: "Dr. Robb of Grove City was in our town yesterday, and he says the road from here to the other town is out-o-sight most of the time." He was listed in Grove City in 1898 and 1900.

About that time, according to recollection of a friend of mine from Grove City, he became ill and they "took him away." His wife was from Saint Paul, and they were married before coming to Meeker county. He was a big gruff fellow with red hair and whiskers and of very aristocratic appearance, was a member of the Episcopal church, and had a fair practice.

Another old settler tells me that the doctor was in Grove City as late as 1900, that about that time they took him to the University Hospital, that he had been acting queer, and that they found he had a brain tumor, and that he "died of it."

Dr. James W. Robertson.—Probably our most illustrious and successful physician to date was Dr. Robertson. He is stated to have come to Litchfield in 1891, but I find a notation in the *Independent* of May 7, 1889, wherein he cared for a patient.

He was born at Perrysburg, Ohio, July 26, 1852. He was educated in public high schools of that city and the University of Michigan. He then entered the Detroit Medical College and graduated with the class of 1877. He then took special courses at Vienna, Edinburgh, and Paris, and returned to become lecturer on laryngology in the Detroit Medical College and professor of obstetrics in the Michigan Medical College for the next ten years. He was on the staff of St. Mary's, Harper, St. Luke's, and Providence Hospitals there. He also served as chief surgeon of the Lake Shore Railway for several years.

When he located in Litchfield, he was a member of the A.M.A. and became a member of the Minnesota Medical Association of which he was elected president in 1911. He was an early member and secretary of the Crow River Medical Society and served as Litchfield's Great Northern Railway surgeon for years. He was a fellow of the American Laryngological Association and had been secretary of the Detroit Academy of Medicine and the Detroit Medical Library Asssociation. He was mayor of Litchfield and a member of the Board of Health and the Board of Education.

He read several papers before the Crow River Valley Medical Society on advances in medical practice of that time. The subject matter was perinephritic abscess in one, and he brought out the occasion of pain when a galvanic current was passed over the abscess and described operating a case under local novocaine anesthesia.

Another case of excision of the rectum for cancer was described, in which Drs. Archibald and Bissel assisted him.

He discussed the use of glycerinated vaccine for smallpox vaccinations and smallpox itself, which was timely then (1901), as an epidemic was in progress throughout the state.

Dr. Robertson developed a large and lucrative practice at once on arrival in Litchfield. He was married previously, September 17, 1872, to Miss Ella J. Phelps. His wife and the doctor himself had relatives among the early pioneers of Litchfield and this may have helped to induce him to come to Litchfield. He erected a large brick building of two stories about seventy-five feet square in conjunction with a pharmacist named Lundemo about 1912, and had a spacious suite of offices on the second floor, with a terrazzo floored operating room and hospital rooms. An elevator was also provided and all modern facilities of the day.

Dr. Robertson was a large strong, ruddy complexioned, sandy haired, blue eyed typical Scot. He was terrifically energetic, fair minded and possessed of a "quick temper." He was much respected by his colleagues and a sterling worker for the advance of medical facilities for the community. In the new Meeker County Memorial Hospital, a room has been furnished in his name, with a suitable plaque on the door, by Dr. George W. Sherwood of Kimball, Minnesota.

Dr. Robertson had three sons—Archibald W., William, and Carl T.—all of whom became physicians, Archie and William returning and practicing in the original building until their early and untimely deaths by coronary disease. Carl served as captain in the Navy as an E.E.N.T. specialist until his death at an early age from the same cause. Four grandsons are living and carrying on the Robertson traditions.

Dr. James W. Robertson died August 13, 1913, following an operation for ruptured appendix and was buried in Ripley cemetery, Litchfield, Minnesota, August 15, 1913.

Dr. John Vincent O'Conner.—Dr. O'Conner practiced in Watkins in the second half of the 1890's apparently only a short time, because in 1898 he is listed in

Waverly Mills, Wright county. It seems he did not leave much of an imprint in Meeker county. In 1900, too, he is listed in Waverly Mills where he supposedly practiced for four years. From Wright county he moved to Saint Paul where he built up a successful practice.

Dr. O'Conner was born on September 1st, 1867. He was an accomplished pianist in Minneapolis and earned the means for his medical education by teaching music. He graduated from the Medical Department of the University of Minnesota in 1895, and was licensed in the same year. Dr. O'Conner died in Saint Paul on April 5, 1932.

Dr. George E. Sherwood.—Born February 14, 1872, Dr. George E. Sherwood, regular, has practiced his profession in Kimball, Minnesota, since October 15, 1900.

Dr. Sherwood's parents were George W. Sherwood and Adeline Hard, who came to St. Paul in 1855. George W. Sherwood was widely known for his trotting horses bred at Sheldon, Iowa. Dr. Sherwood's grandfather was Willam Sherwood, a sea captain in the American Navy during the War of 1812. His grandmother was Jane Bogardus, a descendent of Annese Jans Bogardus, a Hollander who owned a farm on Manhattan Island where historic Trinity Church now stands.

Dr. Sherwood graduated from the Saint Paul High School in 1890 and from the University of Minnesota Medical School with honors in 1894, and received his Minnesota license July 10, 1894. He was one of the first interns at Saint Joseph's Hospital in Saint Paul. In the fall of that year he located at Dassel, Minnesota. He was ambitious and enjoyed a lucrative practice.

In 1898 he purchased a two-story brick building with full basement and installed an early type x-ray machine, one of the first in the county. He added other equipment, employed two nurses and had hospital rooms; and while his major cases were operated in larger hospitals, this might well be called one of the first hospitals in Meeker county, for anesthesia and after-care were available.

On January 12, 1898, Dr. Sherwood was married to Miss Mary E. Milton of Howard Lake, Minnesota. Mrs. Sherwood died of cerebral malacia in 1955. To this union were born three daughters—Jane (Mrs. Orville Nelson, whose husband is an E.E.N.T. specialist), St. Petersburg, Florida; Helen (Mrs. Ed Lax), and Ruth (Mrs. Kenneth Lewis, Detroit, Michigan). A son, George, died of pneumonia in childhood.

While in Dassel Dr. Sherwood was elected president of the city council and was one of the charter members of the Crow River Medical Society. He was a member of the Dassel Board of Education and belonged to the Knights of Phythias, Modern Woodmen, Royal Neighbors, and was active in prohibition circles. He is an ardent nimrod, amateur photographer, gardener, and has for years been interested in purebred Guernsey cattle on his several farms.

He has consistently been a member of the A.M.A., the M.M.A., and the Stearns-Benton Counties Societies, being three times president of the latter. He is a past president of the Northern Minnesota Medical Association. He is at present a member of the Christian Church, Masonic Lodge, and Eastern Star of Kimball and has been president of the State Bank of Kimball.

In 1928 he attended the International Dairy Congress in London on the appointment of President Coolidge, and at that time visited nine European countries. He revisited Vienna in 1930 for postgraduate work. He took an air tour of South America, visiting seven countries, in 1949 and has been perennially in Mexico

1. Unpublished medical history of Wright county by Dr. J. J. Catlin and R. Rosenthal and Obituary in *Minnesota Medicine,* May 1932, page 344.

City and St. Petersburg, Florida, for the past ten winters. In 1955 he again made a pleasure tour of Europe. He has taken extensive motion pictures on these tours which have been greatly enjoyed at medical meetings and throughout his community.

His practice extends well into our county and Stearns county, and he is a member of the staffs of the Meeker county Memorial and St. Cloud hospitals.

Dr. Sherwood is a high principled, industrious, congenial fellow, ever ready to help a good cause, and enjoys the utmost respect and admiration of his fellow doctors and the people of his community.

In 1944 he received the medal for fifty years of practice from the Minnesota Medical Association, together with its well deserved accolades.

He is a linguist of no mean ability, understanding the Swedish and Norwegian terms, speaking French, speaking and reading German well, and being really fluent in Spanish. He is tall, erect, lean and well preserved, enjoying life as much as always.

Dr. Frank M. Archibald, regular, Atwater, Minnesota, apparently came to Atwater for at least part time about 1900, for we find that he read a paper, "Disease of the Tonsils and Their Treatment," before the Crow River Valley Medical Society meeting at Dassel, February 6, 1900. His signature also appeared on a death report in 1898.

His practice extended well into the western portion of Meeker county, and he was a dynamic force in the local progress of medicine. He was known to be ever ready to respond when his services were required. Standing about six feet and weighing in excess of three hundred pounds and inately kind to man and animal, he was affectionately known throughout Kandiyohi and Meeker counties at this time and in 1906 became Mahnomen's first physician, remaining there until his death on March 3, 1936, from cerebral hemorrhage and a fractured leg suffered sixteen days before.

Born December 6, 1865 at Lindenwood, Ogle county, Illinois, he attended local schools and the preparatory school in Dixon, Illinois. He graduated from the Medical College of the University of Illinois in 1893, and married Miss Josephine W. Baily, who died in 1927. A son, Frank, lived in Fargo, North Dakota, and a daughter, Adelaide, in Mahnomen. Further details may be found in Kandiyohi county's medical history.

Dr. Gustav C. Vibrance.—Apparently Dr. Vibrance came to Watkins about 1898, as a death certificate filed in the court house that year bears his signature.

He graduated from the University of Minnesota, year not known, and was licensed in Minnesota April 10, 1900, Certificate No. 1148. His card lists him as deceased but does not say when or where. Apparently he was not a member of the Minnesota Medical Association.

I was advised by Dr. Sherwood that Dr. Vibrance had relatives in Minneapolis and that he was one of the first doctors in Watkins. He states that he died about 1902, but whether before or after he left Watkins, Dr. Sherwood did not know.

Mr. N. H. Ley of Watkins stated that Dr. Vilbrance had two daughters, Viola, married to Lou May in Duluth, and Lillian, married to a Nelson in Minneapolis. Mrs. May did not answer correspondence, and a Nelson in Minneapolis seems futile to search. He further states that he came to Watkins in about 1903 and died at age forty in 1905 at Watkins.

He was listed in Polk's Medical Directory as August Vibrance in Watkins in

1898, and may have been doing "locum tenens" work before finishing his college work.

The following men signed death certificates, practiced in Meeker county a short time, or were mentioned in news items:

Dr. Hoover of Paynesville treated a patient with an infected hand in Manannah in 1884.

Dr. Rollin Cutts, Professor of Surgery at the University of Minnesota later, gave the high school class prophecy at graduation in Litchfield High School in 1885.

Dr. Hillson has "leased the Cochran (or Morris) residence and will carry on his medical practice here again this season."

"**Dr. Carter** of Minneapolis was in Dassel last week paying his monthly visit. He has good business in his chosen calling."—1888.

"**Dr. Wakefield** was in Litchfield examining applicants for pension, together with Dr. Bissel."—August 20, 1889.

Dr. Boeckman of Saint Paul signed death reports 1889 and 1890.

Dr. Lewis R. Fernald of Bellingham and Appleton attended patients in Litchfield. In 1890 he retained Minnesota License No. 165, dated October 15, 1883; and he was a graduate of Albany Medical College in 1875.

"**Dr. J. W. Shaw,** M.D., pulled stakes from Grove City last Friday and went to Minneapolis where he intends to spend the winter. Grove City is again without a doctor and the 'bachelor's hall' is not complete. He stayed only a little more than a month."—1885.

Dr. W. Smalley of Hector attended a sick person in Cosmos in 1889 and also signed a death certificate in 1896.

April 14, 1887: "**Dr. W. E. Aubin,** formerly of Perham has located in this city (Litchfield) and for the present offices at the Howard House. After May 1st he expects to occupy rooms over Wakefield Store. He is a pleasant gentleman and comes well recommended as a physician." The *Perham Bulletin* states the same and that he was at one time a well-to-do physician there and had been there five years. Owing to a sickness in his family, he went to Litchfield. He came from Canada originally.

Dr. Chalmers (or Calmer) of Paynesville signed death reports in 1894 and 1896.

Dr. W. A. Burns of Hector signed a death certificate in 1896.

Dr. G. P. Ferrell of Paynesville did likewise in 1896 and 1899.

Dr. Proesch of Fair Haven also signed death reports in 1889, 1891, and 1898, and was mentioned in Watkins and Eden Valley at that time.

Dr. W. H. Aborn was mentioned in Eden Valley at about 1890.

Dr. Monker, Fairhaven, previously mentioned in 1892 and 1893.

Dr. Sagelin of Hutchinson signed a Meeker county death report in 1893; **Dr. Arnold,** Cold Spring, did the same for 1896; and **Dr. Francis Illstrup,** Cokato, likewise for 1894 and 1895. **Dr. L. S. Schroeder** of Cedar Mills signed a death report for 1896.

Dr. Alfred M. Ridgeway of Annandale signed reports in 1896 and was mentioned as locating in Eden Valley May 9, 1899, but evidently did not remain long. He returned later to Annandale. He also was a member of the "50 Years' of Practice Club." The following is the obituary of Alfred Miller Ridgeway appearing in the June, 1952, issue of MINNESOTA MEDICINE.

"Dr. Alfred M. Ridgeway, a practicing physician in Annandale for over sixty years, passed away May 19, 1952, at the age of ninety.

"Dr. Ridgeway was born in Columbus, Wisconsin, January 29, 1863. In 1882 he came to Minneapolis and was employed in a drug store until 1887, when he entered the medical department of the University of Minnesota. He was graduated in 1890 and was the only intern at the Minneapolis City Hospital before opening an office at Annandale in July, 1890. He took postgraduate study in Chicago in 1895 and again in 1900.

"Dr. Ridgeway helped organize the Wright County Medical Society some sixty years ago. He was a member of the Minnesota State Medical Association and the American Medical Association. He was also a member of the American Association of Railroad Surgeons and had been a surgeon for the Soo Line since December, 1909. He was a charter members of the I.O.O.F. and Rebecca lodges of Annandale and a member of the A.F. and A.M. lodge. He served in the Village Council and was mayor of Annandale in previous years.

"In July, 1940, Dr. Ridgeway's many friends took part in a celebration of fifty years of practice by the physician. Many of those who participated were of the 3,500 brought into the world by Dr. Ridgeway.

"On September 20, 1892, Dr. Ridgeway married Miss Nola Ponsford. She survives him. Although they had no children, they provided a home for many young girls and helped them complete their education." It was my privilege to know this energetic, alert, ruddy-faced man with his close clipped crisp gray mustache and good humor was bubbling—his job was ever well done.

Dr. Croke of Hutchinson signed a death certificate in our county in 1897.

A Dr. A. Anderson in August of 1898 inserted a professional card in a Litchfield paper as a "Scandinavian Physician and Surgeon." In another column it was stated that Dr. Anderson of Minneapolis had made arrangements to locate in Litchfield. I cannot believe that this is the D. Andrew E. Anderson of Minneapolis who helped establish the Swedish Hospital in Minneapolis, but it is possible. No further mention is made in Litchfield.

Dr. George S. Putney of Paynesville also signed a death report in Meeker county in 1899.

Dr. Charles Bolsta practiced a few months in Grove City. He was licensed in Minnesota in 1895 and graduated from Rush in the same year. He was reported in Ortonville from 1895 until as late as 1950. He was described as being "heavy set and dark" by a Grove City resident.

Dr. Nels A. Biorn practiced a short time in Grove City in 1899. He was a student at Hamline College at the time (Minnesota Medical College) and in 1901 graduated and settled in Ada, Minnesota. His son, Rev. Richard Biorn, lives at Northfield.

Dr. Hand (probably **Dr. William R. Hand**) of St. Paul attended patients in consultation with Dr. Chapman and signed death certificates in this county in 1889 and 1899. He graduated (if this be the one) from Cincinatti Physicians and Surgeons College in 1877, was licensed in Minnesota February 18, 1884, License No. 811. He was born in Hawley, Pennsylvania, September 14, 1856. He practiced in Herman, Kasota, and eventually Elbow Lake, where he remained until his retirement in 1936 after sixty years of practice. He died May, 1939, at the age of eighty-two years in Fargo, North Dakota, from "myocarditis, gallstones, and common duct obstruction."

Dr. William E. Tryon, Dassel, "Located in our village in 1900 and was here three years, then left for Minneapolis where he had a good practice till his death in that city." Dr. Tryon was a graduate of the Bennett Eclectic Medical College of 1885. He held Minnesota License No. 1036, dated April 20, 1885. He was listed in 1890, Minneapolis; and 1895 and 1898, Austin; 1903 and 1905, Dassel; and 1909, Minneapolis. He died March 5, 1927, at the age of seventy of coronary sclerosis and diabetes.

We must include a druggist, **Virgil H. Harris,** born in Newark, Ohio, May 14, 1840, and died in Litchfield October 18, 1910. He served in the 111th Ohio

Regiment in the Civil War for three years. He settled in Litchfield in 1870. He was the author of a book. *A Trip Through Hell—An Epic of the Unseen* (a story of the Civil War). He was probate judge for many years; and his son, E. V. Harris, succeeded to the same bench for one term. Inasmuch as some of the stories concerning Dr. Cassel emanated from E. V. Harris personally to me, I cannot but feel that our good judge and pharmacist, Virgil H. Harris, and Dr. Henry E. Cassel spent some convivial evenings in his drug store.

Hospitals.—As previously mentioned. Dr. Sherwood had a few hospital rooms in Dassel in 1898.

The first authentic hospital was operated by a Mrs. Leroy, R.N., in Litchfield, Minnesota, January 1, 1897. Pressures by Drs. Cassel, Chapman, and Robertson with their local confreres were no doubt instrumental in building up this establishment. This continued to be in active use for ten years after the turn of the century, when, as previously noted, Dr. Robertson built his own hospital.

In later years other hospitals followed. Finally in 1952 the present Meeker County Memorial Hospital was built.

* * *

These are the men and women we record as being active in the pioneer days of medical practice in Meeker county. It will be noted then, as now, that men of this profession move about frequently, due to various circumstances, until the currents and eddies of life's river bring them to a tranquil spot. Regular itinerant visits at intervals in smaller towns were more common in those days, and served well the communities, as well as establishing the individual doctor more firmly.

May we appreciate their conscientious efforts amidst those trying days and profit thereby.

Acknowledgment

This has been a cooperative effort to give to the Minnesota State Medical Association the best information we have available concerning the medical care and the doctors of Meeker County from the inception of the county until the year of 1900.

We are indebted to the following:

1. *A Random Historical Sketch of Meeker County, Minnesota,* by A. C. Smith, President of the Bar and Old Settlers Association and said county; Published by Belfoy and Joubert of Litchfield, Minnesota, in 1877; Prepared as an observance of our one hundredth year of independence on the advice of our beloved President, U. S. Grant, and ordered by Hamilton Fish, Secretary of State.
2. *The Album of History and Biography of Meeker County, Minnesota;* Published by Alden Ogle and Company, Chicago, 1888.
3. *Municipal Progress,* 1899.
4. *Those Were the Days.* Published by O. E. Linquist of the *Dassel Dispatch* in 1941.
5. *Condensed History of Meeker County, 1855-1939.* Compiled and published by Frank B. Lamson, Litchfield, and the Brown Printing Company, Litchfield.

We are further indebted to the publishers and owners of the *Litchfield Independent* ("Free and Unshackled"), *The Litchfield Review, The Litchfield News Ledger, The Ledger,* and the *Meeker County News.* There are clippings from other Meeker County papers to which we are also indebted. Most of the quotations will be found in these earlier publications.

6. The Minnesota Historical Society and the A.M.A. have as usual contributed their share.

Perhaps the most valuable personal contributions have been made by Dr. K. A. Danielson, members of the Meeker County Old Settlers' Association, and various friends throughout the county who have searched their memories and their family archives to aid in the accuracy of our records.

Naturally, our chairman, Dr. Robert Rosenthal, with his enthusiasm and ready access to medical records, has been of inestimable help in this effort.

Committee Action

BOARD OF EDITORS
MINNESOTA MEDICINE

Alternations in Format
Gain in Advertising
Section on Public Relations
Increase in Cash Surplus

To the House of Delegates of the
Minnesota State Medical Association:

In addition to the routine activities of the Board of Editors during 1958, the principal efforts of this group at its five meetings during the year pertained primarily to a program of modernization of MINNESOTA MEDICINE. Progress along these lines had been slow during previous years. It was greatly augmented through a combined meeting of the Council, and the Board of Editors to hear Mr. O. M. Forkert of Chicago on December 14, 1957. The drastic alterations in the cover page, format of headings, blurbs, and page proof make-up did not begin bearing fruit until the end of the year.

A report after the first ten months of 1958 from the State Medical Journal Advertising Bureau revealed that MINNESOTA MEDICINE had a gain over 1957 of 40.2 per cent in advertisements obtained by the S.M.J.A.B. The average gain shown by the thirty-three Journals sold by S.M.J.A.B., during this period, was 23.9 per cent, and the highest other than MINNESOTA MEDICINE was a 29 per cent gain. According to Alfred Jackson, "this is fabulous since no other medical journal can report the increase outlined above." I attribute this gain primarily to the many physicians of Minnesota who have published scientific manuscripts of outstanding quality in our State Journal. A combination of this excellent record of advances in medical science with a most pleasing, inviting and acceptable style of publication should improve the national reputation of the Journal.

The cooperation of the various medical specialty organizations of the state has resulted in a selection of manuscripts presented at the meetings of these societies and has made procurement a matter of simple routine. The authors of outstanding scientific articles in out-of-state medical journals have proved an important and dependable source of editorials for our Journal. From the viewpoint of quantity and quality of scientific manuscripts, MINNESOTA MEDICINE could be published biweekly without difficulty.

After years of attempting to do so, it was possible to initiate a Section on Public Relations written and edited by Mr. Carl Woyke. Our Section on Committee Action—representing business and scientific activities of our organizations has faltered through the year, but needs the same intelligent and enthusiastic editorship shown by Mr. Woyke in his section of the Journal. Reports are that physicians throughout the State are very much interested in the activities of the Council and various committees of the society, even if these are simply stated in subject form where more detail does not seem desirable.

Several efforts at promoting and developing a Section on "Clinical Briefs" seemed by the end of 1958 to be headed for failure. The outstanding demand of the membership in the poll on MINNESOTA MEDICINE taken at the last State Medical Association meeting in Rochester was for regularly appearing, brief summarizations of applied medicine. To this end, the Board of Editors have initiated a new approach to the matter, hoping to utilize various state specialty societies for the responsibility of procurement.

Besides a slow failure in the section on "Clinical Briefs," there was a serious paucity of scientific manuscripts in the field of pediatrics, anesthesiology, proctology, and otolaryngology in the volume of 1958. Steps have been taken toward overcoming some of these defects.

The perpetually late publication of MINNESOTA MEDICINE (after the 10th of the month) has shown no improvement during 1958, but the Bruce Publishing Company has now assured us that a new schedule, effective immediately, will correct the situation so that the Journal will be printed by the 10th of the month.

It should be noted that MINNESOTA MEDICINE doubled the cash surplus of 1957, and it has increased roughly four or five times during the last five years, from about $3,000.00 to $15,000.00. This is in spite of the fact that the membership is being charged only $3.00 or half of the usual cost of a Journal of this scientific stature.

The Board of Editors hope to promote, either alone or with the aid of others, a larger circulation particularly among the physicians in the adjoining states and provinces in the near future.

A. H. WELLS, M.D.
Editor

Minnesota Blue Shield-Blue Cross

Minnesota Blue Shield participant subscribers numbered 890,023 as of March 31, 1959. Of this number 107,164 were Plan B subscribers and 782,-859 were enrolled under Plan A contracts.

As of the same date last year, Blue Shield enrollment consisted of 82,880 Plan B subscribers and 788,994 Plan A subscribers or a total of 871,874 persons.

During the twelve months between March 31, 1958, and March 31, 1959, the number of Plan B subscribers increased 24,284 while the total number of Blue Shield subscribers increased only 18,-149. Plan B subscribers represented 12 per cent of the total number of persons enrolled as of March 31, 1959, and the increased Plan B enrollment indicates that a greater number of Minnesotans are willing to pay the additional cost of the higher benefit contract.

Physicians' services eligible for Blue Shield benefits under the two plans are identical, but Blue Shield allowances and the cost to subscribers are greater under Plan B than under Plan A.

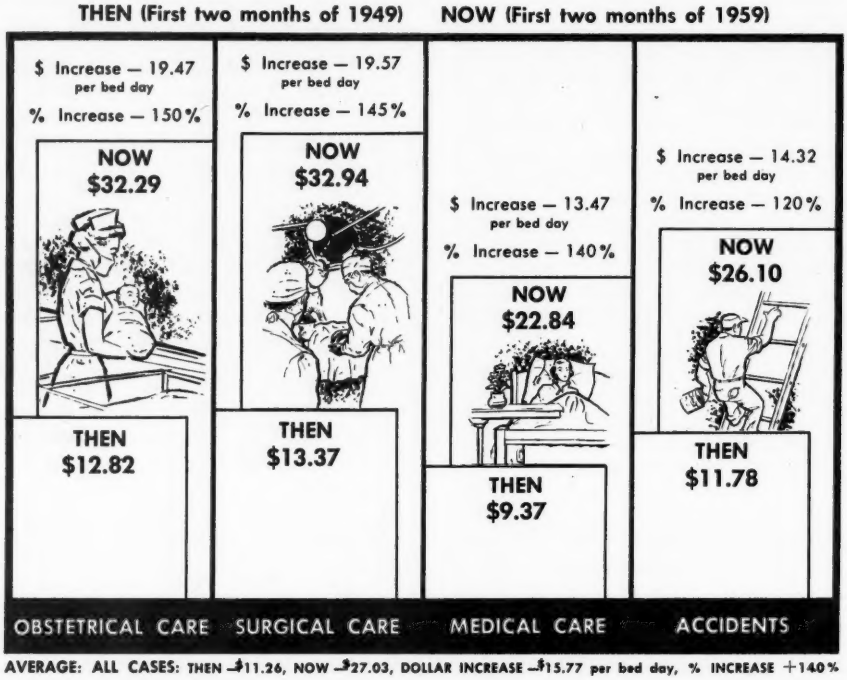
The Blue Shield financial report for the first three months of this year shows that doctors were paid $2,513,886 for 92,930 services rendered subscribers. Blue Shield payments in this period exceeded by $127,629 the amount paid in the same period of last year and allowances were provided for 7,013 more doctors' services than were paid by the Plan in the first three months of 1958.

The accompanying chart shows a ten-year comparison of average Blue Cross benefits per bed-patient day provided in the areas of obstetrical, surgical, medical and accident cases. (January and February, 1949, average compared to January and February, 1959, average.) As can be noted, the average allowance increase of all four categories amounted to 140 per cent.

From the standpoint of benefits paid per patient day, during the first two months of 1949, Blue Cross allowances represented 68.7 per cent of hospital charges. During the same period in 1959, Blue Cross provided allowances equivalent to 80.9 per cent of hospital charges.

INCREASE IN VALUE OF BLUE CROSS COVERAGE

(In terms of Blue Cross allowances per bed patient day)



AVERAGE: ALL CASES: THEN —$11.26, NOW —$27.03, DOLLAR INCREASE —$15.77 per bed day, % INCREASE +140%



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Anorexia and "Weight Lag" Study—Brown, Libo and Nussbaum have reported* consistent and definite increases in rate of weight gain in eighty-six patients, ranging in age from 7 weeks to 15½ years. This beneficial action of Nilevar was observed in the patients with organic and traumatic disorders as well as those whose only complaints were poor appetite and/or persistent failure to gain weight.

In this study, the weight gained was not lost after discontinuance of Nilevar therapy although many patients did not continue the sharp gains effected by the drug.

The authors are of the opinion that Nilevar is a highly useful anabolic agent for influencing weight gain in underweight children.

When Nilevar is administered to children a dose of 0.25 mg. per pound of body weight is recommended and continuous dosage for more than three months is not recommended.

Nilevar is supplied as tablets of 10 mg., drops of 0.25 mg. per drop and ampuls of 25 mg. in 1 cc. of sesame oil. Further dosage information in Searle Reference Manual No. 4.

G. D. Searle & Co., Chicago 80, Illinois.
Research in the Service of Medicine.

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*Brown, S. S.; Libo, H. W., and Nussbaum, A. H.: Norethandrolone in the Successful Management of Anorexia and "Weight Lag" in Children, Scientific Exhibit presented at the Annual Meeting of the American Academy of Pediatrics, Chicago, Oct. 20-23, 1958.

Meetings and Announcements

NATIONAL

The American Academy of Physical Medicine and Rehabilitation, two-day seminar accepted for category II credit for members of the American Academy of General Practice, August 31 and September 1, 1959, Hotel Leamington, Minneapolis, Minnesota.

The American College of Surgeons sectional meetings:

September

Annual Clinical Congress, Atlantic City, New Jersey, September 28-October 2. Dr. Michael L. Mason, Secretary, 40 East Erie Street, Chicago 11, Illinois.

American Heart Association, Annual Meeting and Scientific Sessions, October 23-27, 1959, Philadelphia. Scientific Sessions scheduled for October 23-25 at Trade and Convention Center. Annual Meeting of the National Assembly, Hotel Bellevue Stratford, October 26-27. Information available from Minnesota Heart Association, 1821 University Avenue, St. Paul 4, Minnesota.

The annual course in Postgraduate Gastroenterology, sponsored by The American College of Gastroenterology, will be given at The Biltmore in Los Angeles, California, September 24, 25 and 26, 1959. For further information and enrollment, write to the American College of Gastroenterology, 33 West 60th Street, New York 23, New York.

The Academy of Psychosomatic Medicine has announced its Sixth Annual Meeting, October 15-17, 1959, at the Sheraton-Cleveland Hotel in Cleveland. For further information, write to Dr. Bertram B. Moss, Suite 1035, 55 East Washington Street, Chicago 2, Illinois.

The American Rhinologic Society will hold its fifth annual meeting in the Belmont Hotel, Chicago, October 10. The meeting will be preceded by a surgical seminar in the Illinois Masonic Hospital, Chicago, October 7-9. For further information write to Dr. Robert M. Hansen, Secretary, 1735 No. Wheeler Avenue, Portland 12, Oregon.

The American Institute of Ultrasonics in Medicine will hold their Annual Meeting on September 2, 1959, at the Leamington Hotel, Minneapolis, Minn. For any further information contact John H. Aldes, M.D., Secretary, 4833 Fountain Avenue, Los Angeles 29, California.

National Society for Crippled Children and Adults, Annual Convention, November 29-December 2, 1959, Palmer House, Chicago. For further information, write Miss Catharine Bauer, Director of Information, 2023 West Ogden Avenue, Chicago 12, Illinois.

The Twenty-fourth Annal Congress of the North American Federation, International College of Surgeons, will be held in the Palmer House, Chicago, September 13-17. Surgeons desiring to present papers should write to Dr. Peter A. Rosi, International College of Surgeons, 1516 Lake Shore Drive, Chicago 10.

Pan-Pacific Surgical Association, Eighth Congress, Honolulu, Hawaii, September 28 through October 5 in 1960. Further information and brochures may be obtained by writing to Dr. F. J. Pinkerton, Director General of the Pan-Pacific Surgical Association, Suite 230, Alexander Young Building, Honolulu 13, Hawaii.

A Postgraduate Course in Occupational Skin Problems will be given at the Institute of Industrial Health to be held at the University of Cincinnati, Cincinnati, Ohio, October 26-30, 1959. For further information, write to the Secretary, Institute of Industrial Health, The Kettering Laboratory, Eden and Bethesda Avenues, Cincinnati 19, Ohio.

Twelfth Annual Meeting of the American Association of Blood Banks, Edgewater Beach Hotel, Chicago, Illinois, November 4-7, 1959. For further information write, Office of the Secretary, American Association of Blood Banks, 30 North Michigan Avenue, Chicago 2, Illinois.

Twelfth Annual Conference on Electrical Techniques in Medicine and Biology, Sheraton Hotel, Philadelphia, Pennsylvania, November 10-12, 1959. For further information, write Dr. Herman P. Schwan, Moore School of Electrical Engineering, University of Pennsylvania, Philadelphia, Pennsylvania.

Eighty-seventh Annual Meeting of the American Public Health Association, Atlantic City Convention Hall, Atlantic City, New Jersey, October 19-23, 1959.

INTERNATIONAL

Eighth Bahamas Medical Conference, British Colonial Hotel, Nassau, Bahamas, November 27 until December 17, 1959.

Second Bahamas Surgical Conference, British Colonial Hotel, Nassau, Bahamas, December 28, 1959 until January 16, 1960.

International College of Surgeons, Twelfth Biennial International Congress, Rome, Italy, May 15-18, 1960.

Fourth International Goiter Conference, July 5-9, 1960, London, England, under the auspices of the London Thyroid Club and the American Goiter Association. Application blanks are available from John C. McClintock, M.D., 149½ Washington Avenue, Albany 10, New York, U.S.A.

North American Federation, Twenty-Fourth Annual Congress, International College of Surgeons, Chicago, September 13-17. For information, write The Secretariat, International College of Surgeons, 1516 Lake Shore Drive, Chicago 10.

Pan American Medical Association Congress, Mexico City, Mexico, May 2-11, 1960. For further information, write Dr. Joseph J. Eller, Director General, 745 Fifth Avenue, New York, New York.

Woman's Auxiliary

THIRTY-SEVENTH ANNUAL STATE MEETING REVIEWED

The thirty-seventh annual meeting of the Woman's Auxiliary to the Minnesota State Medical Association was held May 26 at the Hotel Duluth.

The meeting was called to order by the president, Mrs. Reuben F. Erickson, and a warm welcome was extended to all the visiting women by Mrs. Gordon J. Strewler, president of the hostess auxiliary, St. Louis County.

Mrs. A. M. Jensen, Brownton, conducted a most impressive "In Memoriam" service. As the name of each deceased member was read, a rose was presented in her memory. Violin music which accompanied the ceremony was provided by Mrs. A. C. Hilding, Duluth.

The reports of the county presidents and state committee chairmen were read.

The following officers were elected for the ensuing year: President-elect, Mrs. Walter P. Gardner, St. Paul; First Vice President, Mrs. Wallace A. Merritt, Rochester; Second Vice President, Mrs. Harold Benjamin, Minneapolis; Third Vice President, Mrs. William Gjerde, Lake City; Fourth Vice President, Mrs. Benjamin B. Souster, St. Paul; Recording Secretary, Mrs. Milton M. Howell, Glencoe; Treasurer, Mrs. Elmer M. Hill, Minneapolis; Auditor, Mrs. Fred Westerman, Montgomery; Historian, Mrs. John Dordal, Sacred Heart, and Parliamentarian, Mrs. Leo Fink, Minneapolis.

Mrs. Reuben Erickson gave her report capsulizing a year of exhaustive residential activities.

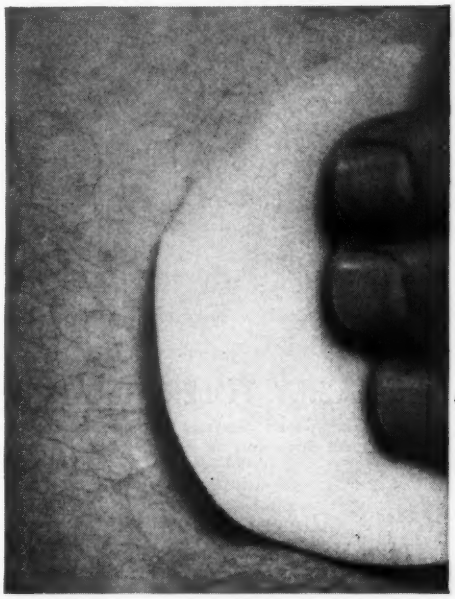
The meeting was adjourned and the Annual Luncheon followed in the Ballroom of the Hotel. The luncheon tables were decorated with garden boxes of assorted pink and white petunias, and favors for everybody.

Two highlights of the luncheon were the presentation and installation of the new president, Mrs. M. F. Fellows, Duluth, by Mrs. H. E. Bakkila, also from Duluth. The installation of the other new officers was done by Mrs. C. L. Oppegaard, Crookston. In relinquishing her office of president to her successor, Mrs. Erickson pinned a rose to the gavel signifying her continued love and devotion for the auxiliary.

A special guest throughout the convention was Mrs. William Mackersie, Detroit, Michigan, Regional Advisor. The women were privileged to hear her very inspirational address on the topic "Wheels of Progress." Mrs. Mackersie reviewed all the standing committees on the state level and concluded by comparing the structure of the auxiliary to that of the wheel: The hub being composed of the state officers and committee chairmen; the spokes comprising the county officers and boards, and the rim representing the membership as a whole. She pointed out that the impact of the wheel in motion is felt most acutely on the rim which in turn depends upon the spokes and hub for its strength.

Mr. E. R. Lambert, former Mayor of Duluth, spoke on the subject, "What the Seaway will mean to Minne-

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Riboflavin (B_2) . . . . 2 mg. 2 M.D.R.
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sota." He described briefly a few of the myriad problems and blessings that attend this tremendous undertaking. Of special interest to the medical groups, he pointed out, was the introduction of new and strange disease germs to which this population has not heretofore been exposed, as well as the different breeds of rodents which accompany the ships and create a health problem as carriers of various disease germs. On the asset side, he predicted that Duluth will shortly become an international shopping center unique in this country, having bazaars and shops supplied directly from all points of the world.

Mr. Lambert's address was very enlightening as he enumerated advantage upon advantage as well as problem after problem—concomitant with the development of an international seaport within our state. The eventual meaning of the Seaway will depend upon the ability of the state as a whole to meet with vision and resourcefulness, the many challenges that will be presented, concluded Mr. Lambert.

Note of Thanks

The women of the State Auxiliary want to congratulate the St. Louis County Auxiliary on a beautifully planned and executed program during the convention. From flowers flown directly from Hawaii for the tables and corsages—for those who stood in the receiving line at the Tweed Art Gallery—to the hot coffee and rolls served each morning on the mezzanine—everything was appreciated and shall be warmly remembered. Co-chairmen in charge of all arrangements were Mesdames M. O. Wallace and I. T. Clark.

ST. LOUIS COUNTY ELECTS OFFICERS

Mrs. John E. Haavik was elected president of the auxiliary to the St. Louis County Medical Society at the annual luncheon recently in the Northland Country Club. Mrs. Haavik succeeds Mrs. Gordon J. Strewler.

Other officers chosen at the session include Mrs. F. W. Conley, president-elect; Mrs. J. B. Moyer, first vice president; Mrs. Richard Bardon, second vice president; Mrs. J. D. Barker, recording secretary; Mrs. C. D. Eklund, corresponding secretary; Mrs. V. R. Krueger, treasurer, and Mrs. H. J. Walder, assistant treasurer.

The on-the-job fatal accident rate ranks farming as the third most dangerous occupation. It is preceded only by mining and construction. There were 14,200 occupational deaths in 1955, and of these 3,700 (26 per cent) were connected with farms.

* * *

About thirty years ago, the usual patient entering the sanatorium with active tuberculosis was a young girl between fifteen and twenty-five years of age. At that time, female patients outnumbered male patients by a wide margin. Today the average patient entering the sanatorium is an elderly man.—*Christmas Seal Health News.*

In Memoriam

GORDON M. ERSKINE

Dr. Gordon M. Erskine of Grand Rapids died May 10, 1959 in Tucson, Arizona, of a lung ailment. He was fifty-nine years of age at the time of his death. His specialty was ophthalmology.

Dr. Erskine was a native of St. Paul and worked in the editorial departments of the *St. Paul Dispatch* and *Daily News* and *Minneapolis Tribune* prior to his graduation from the University of Minnesota Medical School. He practiced medicine in Grand Rapids from 1938 until 1957 when he retired for reasons of ill health.

Dr. Erskine was a member of the St. Louis and Range County Medical Societies, The Minnesota State Medical Association and the American Medical Association.

Survivors are his wife, Gleva; a son, Blain, student at Carleton College, Northfield; a sister, Mrs. E. B. Olwin, Maplewood, and a brother, Grant, of St. Paul.

RALPH K. GHORMLEY

Dr. Ralph K. Ghormley, former head of the section of orthopedic surgery of the Mayo Clinic, died June 6, 1959, of an acute attack of heart disease at Peninsula Community Hospital in Carmel, California. Doctor Ghormley was sixty-six years old.

Doctor and Mrs. Ghormley moved to Carmel a year ago after his retirement from the Clinic April 1, 1958. He was head of the orthopedic section of the Clinic from 1938 to 1955, and then became a senior consultant. Doctor Ghormley also served as president of the Clinic staff in 1952.

Doctor Ghormley was born in Portland, Oregon, February 10, 1893. He received the Degree of Bachelor of Science from Whitworth College in 1914 and Doctor of Medicine from Johns Hopkins University in 1918. From 1917 to 1919 he was a member of the Medical Corps of the American Expeditionary Forces in Europe, attaining the grade of captain and completing his military service at Letterman General Hospital in San Francisco.

In 1919 and 1920 he was an intern in Johns Hopkins Hospital and Children's Hospital School in Baltimore; in 1920 and 1921 was an intern in New York Hospital and in 1921 and 1922 was assistant resident surgeon in Johns Hopkins Hospital.

In 1922, Dr. Ghormley entered into the practice of orthopedic surgery with Doctor Robert W. Lovett in Boston, and in 1922 and 1923 he was an assistant in orthopedic surgery in Harvard Medical School. From 1923 to 1929, he was an instructor in that school, and was attending orthopedic surgeon to the Massachusetts General Hospital.

Doctor Ghormley came to Rochester in September 1929 as a consultant in orthopedic surgery of the Mayo Clinic and assistant professor of orthopedic surgery in the Mayo Foundation. He was advanced to the grade of associate professor in 1932 and to that of professor in 1937. In 1938 he was appointed head of the Section

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of Orthopedic Surgery in the Mayo Clinic, a post he occupied until 1955, when he became a senior consultant. From 1933 to 1940 he served as secretary of the American Orthopaedic Association, and in 1948 and 1949 he was president of the organization. He was president of the Clinical Orthopaedic Society in 1941, and in 1951 and 1952 he was president of the American Board of Orthopaedic Surgery, Inc. He was elected president of the staff of the Mayo Clinic in 1952, and he served as president of the Mayo Foundation chapter of the Society of the Sigma Xi in 1943 and 1944.

Doctor Ghormley was a consultant in orthopedic surgery of the U. S. Veterans Administration. He has been a member of the advisory committee of the Children's Bureau of the U. S. Department of Labor. He was a fellow in the American College of Surgeons and a member of the American Medical Association, the Minnesota State Medical Association, the Zumbro Valley Medical Society, the American Surgical Association, the Clinical Society of Orthopaedic Surgery, the American Academy of Orthopaedic Surgeons, the Western Surgical Association, the American Association for the Surgery of Trauma, the Robert Jones Orthopaedic Society, the International Society of Orthopaedic Surgery and Traumatology, the Alpha Omega Alpha Medical honor society, the Society of the Sigma Xi, the Harvard Club of Boston and the Alumni Association of the Mayo Foundation. He was a corresponding member of the Scandinavian Orthopaedic Society.

In 1957, Doctor Ghormley was honored by former fellows in orthopedic surgery of the Mayo Foundation and his colleagues in the Mayo Clinic, in the form of establishment of the Ralph K. Ghormley Traveling Scholarship. This scholarship is designed to enable the recipients to visit the leading centers in orthopedic surgery in this country, and abroad for observation of the newest advances in the field.

Surviving Doctor Ghormley are his wife, the former Jean McDougal, Winnipeg, Canada, whom he married June 24, 1924; and two children, Lt. Ralph M. Ghormley of the U. S. Navy currently stationed at San Diego, California, and Mrs. Charles Baker of Rahway, New Jersey.

BERT E. HEMPSTEAD

Dr. Bert E. Hempstead, a member of the Mayo Clinic from 1921 to 1950, died April 15, 1959. He was seventy-five years of age at the time of his death.

Dr. Hempstead was a native of Bloomington, Illinois. He received his Bachelor of Arts Degree from Illinois Wesleyan University and his Doctor of Medicine Degree from the University of Michigan. His internship was served at the Northern Pacific Beneficial Association Hospital in Brainerd, Minnesota. In 1912, he went to Europe for graduate training and studied at the University of Vienna. He began his practice in 1913 in Duluth. From 1914-1918 he practiced in Miles City, Montana, before moving to Rochester.

He then joined the Mayo Clinic staff and was appointed an instructor in Otolaryngology and Rhinology in the Mayo Foundation Graduate School in the University of Minnesota. He was advanced to the position of Assistant Professor in 1923 and Associate Professor in 1931.

In 1925, Dr. Hempstead was certified as a specialist in diseases of the ear and throat by the American Board of Otolaryngology. He was a fellow of the American College of Surgeons, member of the American Medical Association, American Academy of Ophthalmology and Otolaryngology, American Laryngological, Rhinological, and Otological Society, American Otological Society, Alumni Association of the Mayo Foundation and the Society of the Sigma Xi. Dr. Hempstead was also a member of the former Olmstead, Houston, Fillmore and Dodge County Medical Society which now is the Zumbro Valley Medical Society.

Survivors are his wife, Millie; a daughter, Mrs. Samuel (Jane) Harper of Madison, Wis.; two sons, Dr. Richard of Spokane, Washington and John of San Francisco; five grandchildren, and four brothers, Earl and Robert of Bloomington, Illinois, Harry of Joliet, Illinois and Bernard of Los Angeles.

JOSEPH W. JESION

Dr. Joseph W. Jesion, former St. Paul physician, died April 29, 1959, in Veteran's Hospital in St. Cloud. He was seventy years of age at the time of his death.

Dr. Jesion, who had resided in St. Paul for 44 years, was associated with the Northern Pacific for thirty-nine years as a physician and surgeon before retiring in 1955. He had resided for a number of years in Pine River, Minnesota.



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SEE PDR

The deceased was born in Milwaukee, Wisconsin, and received his preliminary education at Marquette High School and St. Mary's College located at St. Mary's, Kansas. His medical education was obtained at Marquette University in Milwaukee, Wisconsin. He interned for one year at St. Mary's Hospital in Duluth.

He was a member of Ramsey County Medical Society, the Minnesota State Medical Association and the American Medical Association. In addition he was a member of Court Number 1487 of the Catholic Order of Foresters. He received the British Military Cross for his services with the U. S. Army Medical Corps in World War I.

Survivors are his wife Rose and a sister, Sister M. Stanislaus, Mankato.

HERMAN LINDE

Doctor Herman Linde, Cyrus, one of the state's oldest practicing physicians until his retirement several years ago, died May 10, 1959, at the Stevens County Memorial Hospital, at the age of 87.

Doctor Linde practiced medicine in Cyrus for more than fifty years. On August 28, 1955, Doctor Linde's countless friends in his home community paid high tribute to him at an observance in the Cyrus Lutheran church in recognition of his fifty years of practice at Cyrus at that time.

He was a member of the Cyrus Lutheran church, a member of the Cyrus Board of Education for a number of years and president of the Cyrus Commercial Club for eight years.

He served as a health officer in Cyrus and was Pope county health officer for a number of years. He was a member of Golden Sheaf Lodge, No. 133 AF and AM of Morris. He was a member of the West Central Minnesota Medical Association, the Minnesota State Medical Association and the American Medical Association.

Doctor Linde was born at Sogn, Norway, and received his early education in Norway. He came to the United States in 1892 and settled at Fargo, N. D. He graduated from Concordia College in Moorhead in 1898, taught school for three years, then attended Hamline University medical school and graduated in 1905. He established practice in Cyrus that same year.

Doctor Linde was married in 1912 to Hilma Moe. She passed away in 1918. He was married to Inga Hippe on June 22, 1922. She survives him.

LEONARD G. ROWNTREE

Doctor Leonard G. Rowntree, former chief of the Department of Medicine of the Mayo Foundation, and head of a section of medicine in the Mayo Clinic, died at his home in Miami Beach, Florida, on June 2, 1959.

Doctor Rowntree was born April 10, 1883, at London, Ontario, Canada. He received the degree of doctor of medicine from the Western University Medical School, and was an intern in the Victoria Hospital, London, Ontario.

Doctor Rowntree came to the United States in 1906

to establish a practice in Camden, New Jersey. In 1916, he came to Minnesota as director of the Department of Internal Medicine of the University of Minnesota Medical School.

Doctor Rowntree came to Rochester, Minnesota, on April 1, 1920, as head of a section of medicine and professor of medicine in the Mayo Foundation, Graduate School, University of Minnesota. On January 1, 1922, he was appointed head of the Department of Medicine of the Mayo Foundation.

He left the Mayo Clinic and Mayo Foundation in September, 1932, to become director of the Philadelphia Institute for Medical Research and to practice internal medicine in that city. From 1933 to 1955 he was also a member of the advisory board to the Biochemical Research Foundation, and he was chairman of the Deans' Committee for Veterans Administration Hospitals, Miami and Coral Gables, Florida. He also served as chief of the medical division of the headquarters office of the Selective Service System, Washington, D. C., from 1940 to 1945, and in 1944 and 1945 he was chairman of the National Joint Committee on Physical Fitness of the Federal Security Administration. From 1945 to 1950 he was the chief medical advisor and chairman of the medical advisory board of the American Legion, and he was a vice president of the National Committee for Mental Hygiene. He was the recipient of a Presidential Medal of Merit in 1945 from President Truman.

Doctor Rowntree was president of the American Society for Clinical Investigation in 1921, and of the American Society of Endocrinologists in 1929. He was a fellow of the American College of Physicians and a member of the American Medical Association, the American Association for the Advancement of Science, the Association of American Physicians, the American Association for the Study of Internal Secretions, the American Physiological Society, the American Pharmacological Society, the American Society of Biological Chemists, the American Society for Experimental Pathology, the Alumni Association of the Mayo Foundation, Phi Beta Kappa, the Society of the Sigma Xi and the Phi Beta Pi professional medical fraternity.

Doctor Rowntree was married to Miss Katharine Campbell, July 9, 1914. Doctor and Mrs. Rowntree had two daughters: Mrs. Mary Laird Wallace, II, Schnectady, New York; and Mrs. H. Clinton Davis, Miami, Florida.



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CLIFFORD N. RUDIE

Dr. Clifford N. Rudie of St. Paul, died April 16, 1959. He was fifty-nine years of age at the time of his death. His specialty was psychiatry.

For the past nine and one-half years, Dr. Rudie had been on the staff of the St. Peter State Hospital. A native of Sissiton, South Dakota, Dr. Rudie obtained his medical education at the University of South Dakota, in Vermillion, the University of Louisville, located in Louisville, Kentucky. In addition, he attended Augsburg College in Minneapolis, St. Olaf College in Northfield and the University of Minnesota. He interned at Miller Hospital in St. Paul. Before moving to St. Peter, Dr. Rudie practiced medicine from 1929-1931 in Mazeppa, Minnesota; 1931-1941 in Kenyon, Minnesota; 1942-1946 in California; and 1947-1949 in Wanamingo, Minnesota.

He was a member of the Nicollet-LeSueur County Medical Society, the Minnesota State Medical Association and the American Medical Association.

Survivors are his wife; three children, Richard, psychologist at the Moose Lake State Hospital, Mrs. James Brislance, Saragosa, Spain, and Frederick Rudie, a senior at St. Olaf college at Northfield; and two grandchildren. Also surviving are his mother, six sisters and one brother all residing on the west coast.

ARTHUR H. SANFORD

Doctor Arthur H. Sanford, former head of the Section of Clinical Pathology of the Mayo Clinic for thirty-five years and director of laboratories at Rochester State Hospital since June 1950, died unexpectedly April 28, 1959, of coronary insufficiency. He was seventy-seven years old at the time of his death.

Doctor Sanford was a member of the Rochester School Board from 1924-40 and served as president for fourteen years of that time. Doctor Sanford also was a president of the Kiwanis Club and the Rochester Community Chest, was honored in 1940 by the Rotary Club for his contributions to the city and was very active in the work of the First Methodist Church.

In May 1957, Doctor Sanford was honored by the Minnesota State Medical Association for fifty years in the practice of medicine.

The annual Arthur H. Sanford lecture in pathology,

presented each year at the scientific sessions of the state medical meeting, is presented in tribute to the Rochester man. It was established by the Minnesota Society of Clinical Pathologists in 1947. In October 1956, he was honored at the annual meeting of the College of American Pathologists with the award of the Scientific Products Foundation.

Doctor Sanford was co-author, with the late Doctor James C. Todd, of "Clinical Diagnosis by Laboratory Methods," a standard text in the field, the twelfth edition of which appeared in 1953, with Doctor Benjamin Wells, as co-author. Doctor Sanford also contributed some one hundred papers and other writings to the literature in his field.

With Doctor Charles Sheard and Dana Rogers of the Clinic, he devised the first successful photo-electric colorimeter for the quantitative determination of hemoglobin and other chemical constituents of the blood. This was reported in 1932, and in 1933, Doctor Sanford was awarded the Ward Burdick gold medal by the American Society of Clinical Pathologists.

Doctor Sanford was born in New Albin, Iowa, January 12, 1882. He enrolled as a student at Northwestern University, from which he received the degree of bachelor of arts in 1904, and the degrees of master of arts in physiology and doctor of medicine in 1907. From 1907 to 1911, he was a member of the faculty of medicine at Marquette University, where he was successively assistant professor, associate professor and professor of physiology. He was licensed to practice medicine in Illinois in 1907, and also in Wisconsin. He was licensed in Minnesota in 1916.

He was a charter member of the American Society of Clinical Pathologists, and in 1927, and 1928, served as president of the society. When the American Board of Pathology, Inc., was founded in 1936, Doctor Sanford was elected first president of the board, a post he occupied until 1946.

Doctor Sanford was a fellow of the American College of Physicians, member of the Minnesota State Medical Association, the Zumbro Valley Medical Society, American Medical Association, American Association for the Advancement of Science, American Society of Immunologists, Society for Experimental Biology and Medicine, Alumni Association of the Mayo Foundation, Society of the Sigma Xi, Alpha Omega Alpha medical honor society, Alpha Kappa professional medical fraternity and Sigma Nu academic fraternity. He was also a 32nd degree Mason (Scottish Rite) and a Knight Templar (York Rite).

Survivors are his wife, Margaret; a son, Doctor A. Raymond A. Sanford, Mankato; four grandchildren, and a brother Harold Sanford of Winter Park, Florida. A daughter, Gertrude, died in 1940, and a son, Dr. Hawley S. Sanford, died in 1948.

SIDNEY A. SLATER

Doctor Sidney A. Slater, Worthington, died June 11, 1959. He was seventy-four years old at the time of his death. Death was due to complications of a previous lung ailment.

Doctor Slater, a renowned authority on tuberculosis, was superintendent of the Southwest Minnesota Sanitarium for twenty-eight years. The deceased was president of the Minnesota Tuberculosis and Health Association from 1938 to 1943 and was on the Board of Directors of the National Tuberculosis Association for twenty-six years. He was also a past vice president of the Minnesota State Medical Association and served for ten years as a member of the House of Delegates.

In addition, Doctor Slater was a past president of the Venengo County Pennsylvania Medical Society, the Southwestern Minnesota Medical Society, the Southern Minnesota Medical Society and the Sioux Valley Medical Society.

The deceased was also a member of the AMA, the American College of Chest Physicians, the American College of Physicians and the American Trudeau Society.

Doctor Slater was born in Enfield, Virginia, and received his medical education from the medical college of Virginia in Richmond.

He is survived by his wife.



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Communications

This Section is for you to voice your convictions, comments, and queries on all subjects political, economic, historic, humorous, scientific or otherwise, to many physicians. Writings not sufficiently formal and too brief for an editorial or a scientific manuscript are requested. Clinical and research observations, no matter how brief, similar to those in *The Lancet* (London), are particularly encouraged.

THE ADVANTAGES OF THE AMERICAN FREE ENTERPRISE SYSTEM

By Carol Pryor
Elizabeth, New Jersey

Of all the freedoms enjoyed by Americans, one whose roots lie deep in tradition is that of free enterprise. From the earliest settlement of the new world, our ancestors had to develop means of providing for their daily needs. Food, shelter, and clothing had to be wrested from the natural resources found in this strange, new land which was to be their home.

Because these early settlers were fleeing the serfdom or slavery of their mother countries, they wished to insure freedom for their children in the years to come. In declaring their political freedom, they laid down in that immortal document, the Declaration of Independence, these principles: "We hold these truths to be self-evident: that all men are created equal; that they are endowed by their creator with certain inalienable rights; that among these are life, liberty, and the pursuit of happiness." These men had set their goals and they meant to reach them. To them the possession of private property ranked in importance with freedom of speech, freedom of the press, the right to vote, and the right to engage in whatever profession they chose. "The pursuit of happiness," therefore, implied free enterprise and private ownership.

Exercising their right of private ownership and free enterprise, these pioneers in industry made rapid progress. Before the coming of the railroad, in many communities little industries were carried on in a simple way—a flour mill operated by a water wheel; a wheelwright shop, a chair factory, a pottery, a tinsmithy. The blacksmith, varied the routine of shoeing horses of the countryside with making tools for the farms and households. In the larger towns might be found a bakery or two.

In these early days the owner of the plant was also the master workman, employing either his sons or an apprentice or two. He carried his money in a leather bag attached to his belt, and did his bookkeeping at night by candle-light. He made his own deliveries by horse and wagon to his customers who lived at a distance.

With the advent of the railroad, many small units of industry found it more profitable to form one large unit. However, many of the local manufacturers preferred to carry on their own business, depending upon the loyalty of their customers. As late as 1850, a manufacturer of farm implements could have only five employees and yet be as large as the average. He could be an independent manufacturer, and yet have only $2,600 as his capital. By 1910, it took $400,000 to be an average manufacturer of agricultural implements. In 1859, there were 1333 factories making farm implements; by 1910, the number had shrunk to 640—though quantity of goods turned out had grown in value from $6,000,000 to $146,000,000. This same change occurred in the cotton goods and steel industries. All this was the result of the business man's freedom to consolidate or to remain independent.

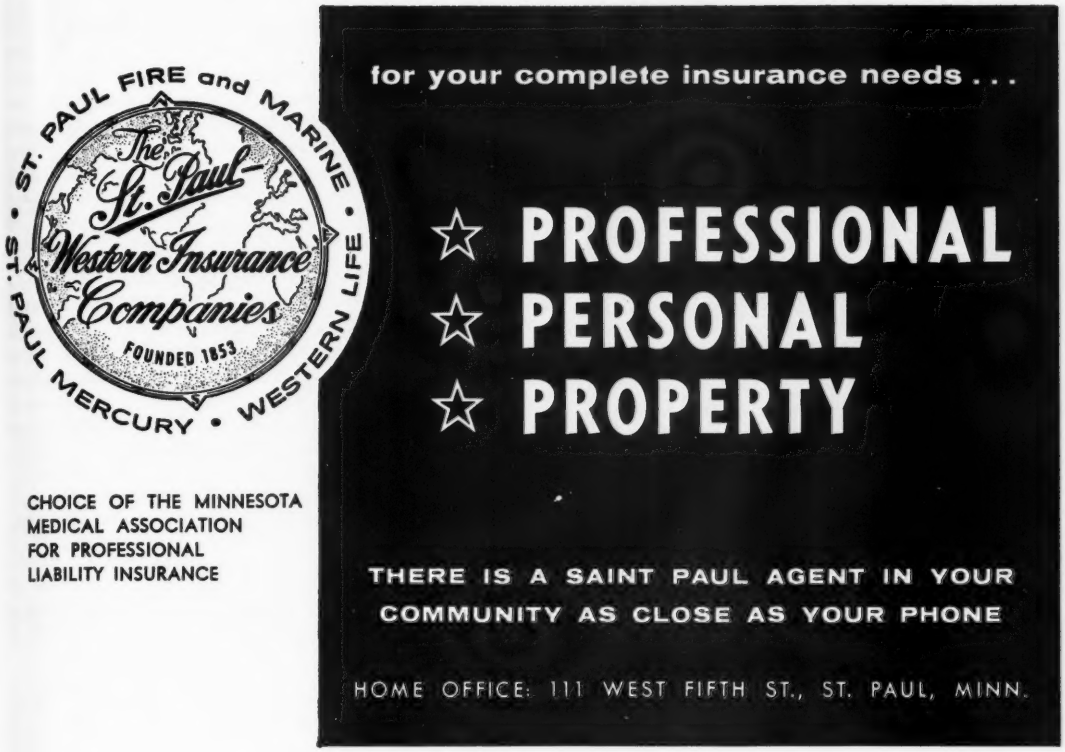
Of the old-time businesses that continued independently, one of the best known is the DuPont Company, founded as manufacturers of powder at Wilmington, Delaware, in 1802. DuPont's is now a leader in many additional lines. The wide variety of products, nationally advertised and sold, is evidence of the skill, ambition, and inventive genius of the men who made DuPont one of the monuments to the system of free enterprise.

The automobile industry is another giant that grew out of man's freedom to use his inventive genius and skill. When man realized the need for more efficient transportation, he immediately went to work to design what was known as the "horseless carriage." Although he was laughed at, he was not discouraged. Suddenly the idea caught on, and the demand was greater than the supply. With the development of the assembly line process, cars could be produced more rapidly, and eventually, at a cost within the average man's budget. Now the average family owns at least one and, sometimes, two cars.

Winner of first prize in the 1959 National Essay Contest for high school students sponsored by the Association of the American Physicians' and Surgeons' Freedom Programs in cooperation with state and county medical societies.



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In this half of the twentieth century, the supermarket —a distinctly American institution—spurred on by competition—is rapidly becoming bigger and better, offering more space for a greater variety of products. However, the small corner grocery store, the village bakery, and the delicatessen still have their rightful and necessary place in our American way of life. Both types of businesses serve the needs of a rapidly growing population more satisfactorily than any government "planned economy" system could.

Free enterprise is the basis of our American way of life, encouraging people to be creative and ambitious. It provides more benefits for the greater number of people than any other system yet devised by man, and keeps our standard of living high. By contrast, socialism kills incentive. It merely tends to take anything created by free enterprise and dispose of it for "the better interests of humanity" according to the false socialistic way of reasoning. The socialist would put all men on the same level, the hard-working tradesman, the skillful, inventive genius, and the shiftless, good-for-nothing loafer. A famous English scientist once said: "A capitalist is a man who, if he himself is doing well, doesn't mind if others are living better. A socialist, on the other hand, is a man who doesn't care how badly he himself is living as long as nobody else is allowed to live better."

A. M. Rosenthal, correspondent for the *New York Times* in Poland, made this comment in one of his articles published recently: "This reporter after years in a would-be Socialist country and in a Communist area, finds himself influenced quite sharply by his experiences. Month by month his appreciation of the expansiveness and variety of American life, in contrast to the sort of drab prissiness in which socialism and communism wrap themselves, grows."

West Germany has provided a good example of free enterprise. After the second World War, she had a choice between the European and United Kingdom socialist pattern (heavy control, rationing, tremendous emphasis on equality) or free enterprise (emphasis on incentive and free marketing). West Germany chose free enterprise and has risen to the status of an economic and financial king in Europe.

In our own country, government control in agriculture has proved a failure. Ezra Taft Benson, Secretary of Agriculture, has said that he felt the great majority of farmers would much prefer to have less government in agriculture, rather than more. He believes it is necessary to recognize that "controls are a failure; that you can't effectively control production by legislation."

In spite of what experience has proved in our own country and abroad, there are many so-called Americans abusing the democratic system of free competitive enterprise. They contend that the government owes a living to any citizen or group of citizens; that it should provide special privileges and benefits to various communities. What they are actually clamoring for is the destruction of freedom of action and opportunity. Furthermore, they fail to realize that before the government puts a dollar into the hand of anyone, it must first take that dollar out of his pocket, plus the cost of collecting, bookkeeping, distribution, et cetera.

From the window of our school library, I can see every day what I think is one of the greatest tributes to our American system of free enterprise. To me it represents free enterprise on the move—a well-used railroad transporting hundreds of freight cars daily, carrying State of Maine products, Florida fruits, oil, coal, live stock, scrap metal, and dozens of other raw materials and finished products. Through the underpass of this



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same railroad runs one of America's busiest highways. Conveyances of all types pass here in a steady stream. It is a familiar sight to see a small truck farmer bringing his produce to market behind a giant trailer truck carrying four bright, new cars to their destination. In another lane a huge oil truck will pull up beside a gaily painted florist's delivery car. And so the endless procession goes on day and night—trucks of all sizes, shapes, and models, carrying the fruits of man's labor to all parts of the country. Would the picture be the same if all these industries represented were government controlled?

America has come a long way since the day of the village blacksmith, the country store, and the horseless carriage. She has amazed the world by her progress. Only by man's freedom to produce according to his capacity, and to consume or dispose of what he produces according to his own judgment, respecting the rights of others, has this progress been accomplished. Those who still believe in our constitutional democracy have a sacred responsibility to protect this right of the individual—"The right to life, liberty, and the pursuit of happiness" by fighting to hold fast to our American system of free competitive enterprise.

There were 24,830 pedestrians injured crossing intersections *with* the signal in their favor during 1958 in the United States.

* * *

In 1958, more than 49 per cent of the traffic injuries resulted from weekend accidents.



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The Physician's Diary

Dr. William S. Pollard, Duluth, was recently certified by the American Board of Neurologic·Surgery at a meeting in St Louis, Missouri. In addition, he recently addressed the staff meeting of the Itasca County Memorial Hospital in Grand Rapids on "The Management of Head Injuries."

* * *

Dr. John F. Briggs, St. Paul, recently gave the Louis Mark Memorial Lecture before the American College of Chest Physicians in Atlantic City, New Jersey. Dr. Briggs spoke on "Optimism in Heart Disease." The Louis Mark Memorial Lecture is in memory of the late internationally known chest physician who was a native of Minnesota.

* * *

Dr. Franklin C. Anderson, Owatonna, has been named medical consultant for the Federated Life Insurance Company. The position is on a part-time basis allowing Dr. Anderson to continue to devote the major part of his time to his position at the Owatonna Clinic.

* * *

An exhibit, "Misleading Thoracic Roentgenograms: Abnormalities That May Stimulate Diseases of the Lung, Bony Thorax or Mediastinum," by **Drs. C. H. Hodgson, John A. Callahan** and **Arthur H. Bulbulian,** of the Mayo Clinic, and Dr. André J. Bruwer, of Tucson, Arizona, formerly of the Mayo Clinic, was awarded the blue ribbon, or first award, among scientific exhibits at the Industrial Health Conference sponsored by the Industrial Medical Association and other organizations in Chicago recently.

* * *

Among twelve Minnesota scientists receiving research grants totaling $136,604, were **Dr. Richard A. DeWall** and **Dr. Cecil J. Watson,** both of the University of Minnesota. The announcement was made recently by **Dr. Karl W. Anderson,** President of the Minnesota Heart Association.

* * *

Dr. John W. Kirklin, Mayo Clinic, is one of 170 doctors who have been elected to fellowships in the American Academy of Pediatrics, the Academy has announced.

* * *

Dr. N. N. Ninneman has joined the medical staff of the St. Peter State Hospital. Leaving private practice at Waconia, Minnesota, Dr. Ninneman began his duties at that institution recently.

* * *

The St. **Louis County Medical Society** co-sponsored the annual Florence Nightingale dinner along with the Second District Nursing Association and the Northeastern League for Nursing Hospital Administrators. Guest speaker of the evening was George Grim, Minneapolis reporter, analyst and lecturer.

Governor Orville L. Freeman has appointed **Dr. John A. Callahan,** Mayo Clinic, a member of the Minnesota State Board of Examiners in the Basic Sciences, for a six-year term expiring on April 1, 1965.

* * *

Dr. Rauen Curtis, LeCenter, has resumed his medical practice on a limited basis following a severe heart attack several months ago.

* * *

Dr. Melvin G. Oppen, Wayzata, and **Dr. Roger S. Johnson,** Excelsior, have been added to the staff of Doctors Memorial Hospital, bringing the staff to seventy-three.

* * *

Recently elected a director-at-large of the National Tuberculosis Association was **Dr. David T. Carr,** Mayo Clinic, at the Association's annual meeting, held in the Palmer House in Chicago. Another Minnesotan, Mrs. C. L. Oppegaard, Crookston, was elected to the board.

* * *

Thirty physicians and their wives assembled in the Elks Club, Thief River Falls, for the annual spring dinner meeting of the Red River Valley Medical Society. **Dr. H. D. Clapp,** Crookston, president, was in charge of the program which included a paper on "Cholesterol Metabolism" by **Dr. Rolf Andreassen,** Minneapolis.

* * *

Dr. O. F. Ringle, Walker, has leased the former Walker Hospital building to the Cass County Welfare Board for new offices and quarters. Dr. Ringle will continue to operate his clinic on the North end of the first floor of the building.

* * *

Dr. C. O. Hansen, Minneapolis, has been named to a five member commission to govern the Hennepin County Tuberculosis Sanatorium at Glen Lake. He will serve in that capacity until May 1, 1962.

* * *

Dr. Lloyd T. Wood, formerly of Forest Lake, has been elected a partner of the Olmsted Medical Group. The other partners are **Drs. H. A. Wente, J. R. Doyle, J. E. Verby, J. R. Watson, H. F. Burich, M. K. Campbell, W. R. Weyhrauch,** and **J. C. Brodhun.**

* * *

A $1,000 grant for research in arthritis has been awarded **Dr. Charles A. Slocumb** of the Mayo Clinic. Dr. Slocumb is a former president of the American Rheumatism Association.

* * *

Spring Valley physician, **Dr. L. W. Clark,** was recently honored by that community for his fifty years of service in the practice of medicine. The "Dr. Clark Day" observance included an open house and program held in Our Savior's Lutheran Church of Spring Valley. Most of his medical practice has been in Spring Valley and Chester, Iowa.

Dr. Darwin K. Holian, Albert Lea, was a recent speaker at a meeting of the Albert Lea Kiwanians. He spoke on advances in surgery during the past twenty years.

* * *

Dr. H. P. Hinderaker has announced that he is discontinuing practice with **Dr. Leo O. Furr** of Bird Island. He will be resuming practice in Willmar, Minnesota.

* * *

The Patton, California, newspaper has announced that **Dr. D. H. Garlock,** a former practicing physician from Bemidji, Minnesota, has retired. Dr. Garlock expects to spend his summers here in Minnesota.

* * *

Dr. John W. Schut, Anoka, recently announced that he has given up his medical practice. Dr. Schut plans to spend his time in the research of ataxia, of which he is a victim.

* * *

Dr. A. M. Scheidel, Mankato, recently returned from Chicago where he passed the second part of a two-part test given by the American Board of Internal Medicine. Dr. Scheidel took the first part of the Board Certifications test last October.

* * *

Dr. E. S. Boone and **Dr. A. C. Martin,** Luverne physicians, will share a new building beginning approximately on October 1. The building will house separate offices for the two physicians.

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Waseca, Minnesota, gave honor to **Dr. Ben J. Gallagher,** who devoted most of his medical practice to that town. A testimonial dinner was given Dr. Gallagher and his brother, Justice Frank T. Gallagher. **Dr. Harold Habein,** Mayo Clinic, was the guest speaker.

* * *

Dr. Winchell McK. Craig, Mayo Clinic, has announced his resignation as Rochester Civil Defense Director following an offer of a position with the AMA.

* * *

Dr. C. A. E. Lund, medical director of the six-county Minnesota Health District Four, announced his resignation recently. He will become director of the Calhoun County Health Department at Battle Creek, Michigan.

* * *

The National Epilepsy League has awarded a citation to **Dr. A. B. Baker,** head of the Neurology Division, University of Minnesota, for his contributions that enable persons with epilepsy to lead normal lives.

* * *

A recent speaker at an institute on alcohol studies at Western Michigan University, Kalamazoo, was **Dr. Nelson Bradley,** superintendent of Willmar State Hospital.

* * *

Dr. H. Z. Giffin, emeritus member of the Mayo Clinic staff, retired recently as president of the Olmsted County Tuberculosis and Health Association, which he has headed for twelve years. New president is **Dr. Alfred G. Karlson.** Dr. Giffin will serve as vice president. Also elected into office were Dr. C. W. Mayo, Dr. John S. Lundy, and Dr. C. H. Hodgson. Members of the Nominating Committee were Dr. A. M. Olsen, chairman, Dr. A. F. Risser and Mrs. George B. Logan.

* * *

Dr. Mancel Mitchell, Minneapolis, was a recent speaker at a meeting of the Southwest Minnesota Medical Society. A report was made of the recent State Medical Association meeting in Duluth by **Dr. John Lohmann,** Pipestone, and **Dr. O. M. Heiberg,** Worthington, the society's delegates to the meeting.

* * *

Announcement was made recently of definite commitments that will result in the replacement of **Dr. R. W. Nicholson** and **Dr. C. L. Plott,** Heron Lake physi-

ORTHOPEDIC APPLIANCES

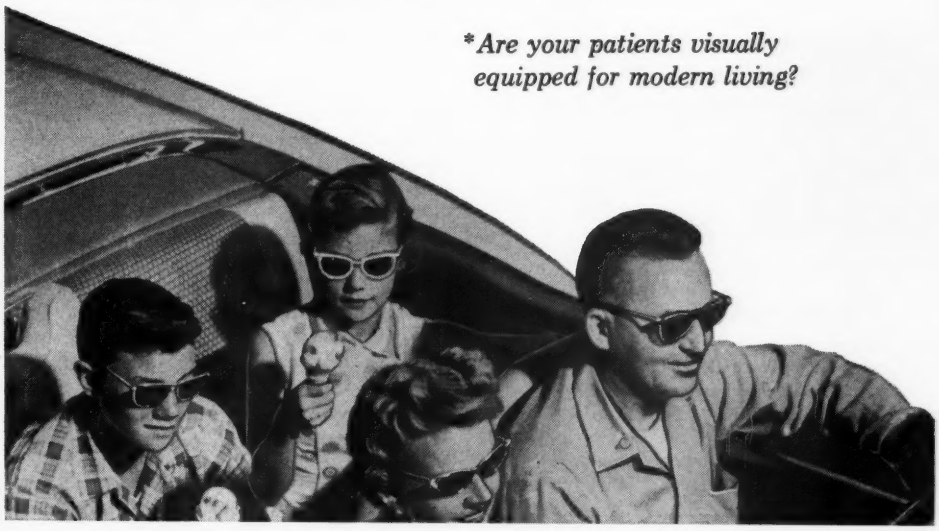
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cians. Dr. Plott has promised to stay until one or both of the new physicians arrive so that Heron Lake will not be without medical service.

* * *

Recently named as president-elect of the American Gastroentrological Physicians Society was **Dr. Hugh Butt,** Rochester. The announcement was made at the society's annual meeting.

* * *

Dr. Herman J. Just, Hastings, has recently received a letter from Lt. Col. Murley A. Reep, in appreciation for his fifteen years of service to the Selective Service System of Minnesota.

* * *

At a recent meeting of the Southeastern Minnesota Chapter of the American Academy of General Practitioners in Wabasha, **Dr. A. B. Hayles,** Rochester, spoke on "Endocrine Problems in Pediatric Practice." **Dr. Donald R. Shahn,** director of the Cancer Detection Center, University of Minnesota, spoke on "Evaluation of Cancer Detection Methods." "Forceps Delivery" was the title of the paper presented by **Dr. Alex Barno,** St. Louis Park Clinic. **Dr. M. R. Williams,** Cannon Falls, presided and **Dr. L. M. Ekstrand,** Wabasha, was in charge of local arrangements.

* * *

Dassel physicians, **Dr. Joseph Houts** and **Dr. Marvin W. Johnson,** have recently moved into the new clinic-pharmacy building in Dassel.

* * *

Dr. Norbert J. Lilleberg, St. Paul, has been elected president of the medical staff of Miller Hospital, St. Paul. Other officers elected were **Dr. Edward J. Richardson,** first vice president; **Dr. C. N. McCloud, Jr.,** second vice president; **Dr. E. V. Kenefick,** chairman, Committee on Medical Services; and **Dr. Hugo F. Schroeckenstein,** chairman, Committee on Administrative Policy.

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Triumph physician, **Dr. Edgar R. Gamm,** recently began practice in Park Rapids. Dr. Gamm is in partnership with **Dr. Norman J. Haugan** and **Dr. Paul T. Grimes,** in the new Medical Arts Building.

* * *

Dr. James W. DuShane, head of the Section of Pediatrics of the Mayo Clinic and associate professor of pediatrics in the Mayo Foundation, has recently been elected to membership in the American Pediatric Society. The announcement was made at the society's annual meeting at Buck Hill Falls, Pennsylvania.

* * *

At the annual meeting of the American Dermatological Association in Atlantic City, New Jersey, recently, it was announced that **Dr. Harold O. Perry,** Mayo Clinic, had been elected to membership in that society.

Newly elected president of the Ramsey County Tuberculosis and Health Association is **Dr. George C. Roth,** St. Paul. He succeeds Edward A. Knapp, who had been president since 1945.

* * *

Lakefield citizens recently honored **Dr. J. T. Rose,** at a recognition dinner of his fifty years as a rural doctor. Dr. Rose has practiced forty-six years in Lakefield.

* * *

The Board of Directors of the Minnesota Alumni Association recently conferred on **Dr. Lillian Nye,** St. Paul, the title of Graduate Emeritus for her fifty years of loyalty to the University of Minnesota at the golden anniversary reunion of the class of 1909.

* * *

Dr. Sheldon L. Mandel was a guest lecturer at the June meeting of the Montana Section of the American Academy of General Practice which was held at East Glacier Park, Montana. Dr. Mandel spoke on "Recognition and Treatment of Common Dermatologic Problems" and "Drug Reactions: Cutaneous and systemic Manifestations."

* * *

Professor Richard G. Bond, director of the division of environmental health and safety in the University of Minnesota Health Service, recently received word that he has been elected an honorary fellow of the Royal Society of Health of Great Britain. This honor is conferred upon persons who have distinguished themselves in connection with the promotion of health.

A graduate of the Universities of Iowa and Minnesota, Professor Bond was at the University as a visiting lecturer in the school of public health in 1944 and 1945 and returned to join the Health Service staff in 1949.

He is a member of the governing council of the American College Health Association and has served as consultant to the National Institutes of Health of the United States Public Health Service. He presented a paper at the Royal Society's annual meeting last April.

The Royal Society of Health is the counterpart of the American Public Health Association. Since its founding, approximately 100 honorary fellows have been elected from countries throughout the world. Professor Bond is one of some thirty elected from the United States.

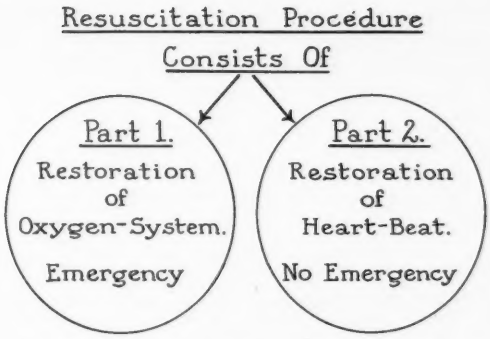


Fig. 1. This separation gives scientific order to the procedure when orderly conduct is a requirement for success.

Resuscitation of the Heart

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THE purpose of this paper is to discuss death from the standpoint of its reversibility. "Reversal of the death-factor" is a strange combination of words with a meaning that probably is unfamiliar. The terms "temporary death" and "permanent death" may also be unfamiliar. We believe that there is now a place in our medical thinking for these terms and we shall try to give them meaning.

In Moscow there exists a "Resuscitation Institute" and in each large hospital of that city there is a group whose efforts are directed only to "Resuscitation." This group has charge of death, so to speak, and it functions not only in the operating rooms but throughout the hospital. This development has potential military value and is, therefore, important. For surgical operations a systemic artery is routinely exposed but it is not cannulated. This artery is exposed so that oxygenated

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blood can be given into this artery without delay should it become necessary. This is one of the Russian ways to meet an emergency. It involves



Fig. 2. Required equipment with every patient for every operation and every diagnostic procedure in x-ray. Standing rule of the hospital.

a serious and drastic step towards protection of the patient. In this respect Russia is ahead of America in taking steps to protect the patient during operation. In America most of the hospitals do not even possess the necessary equipment for resuscitation and little or no effort has been made to train the staff in methods of resuscitation. Perhaps legal action in the courts will be necessary to correct this deficiency. In many of our medical schools there is no instruction in this subject.

Time of Death.—The end of life and the beginning of death must have a sharp and instantaneous line of separation between the two. The purpose of this sharp and instantaneous line is to start the race against time for resuscitation. To delay this race is to invite failure. Death begins as soon as the oxygen-system breaks down, as soon as the heart takes its last forceful beat, as soon as the patient takes his last breath. The brain cannot get along without a constant supply of oxygen. If the oxygen-system is broken down for three to five minutes, degenerative changes of an irreversible nature set in. This is a key-point in resuscitation. It makes no difference to the person or persons who do the resuscitation procedure as to the definition or timing of death. There is this period of time when death may be considered temporary and reversible but to the man of action, death begins at the breakdown in the oxygen-system. If death begins when there is no possibility of resuscitation then the man, woman or child is alive up to that time and if he is alive there is no purpose in carrying out this unpleasant job of resuscitation.

This timing of death negates action. It is for the religious officer and for the physician who does not believe in resuscitation or does not understand resuscitation. To try to resuscitate is to invite failure. To fail is to invite criticism. To

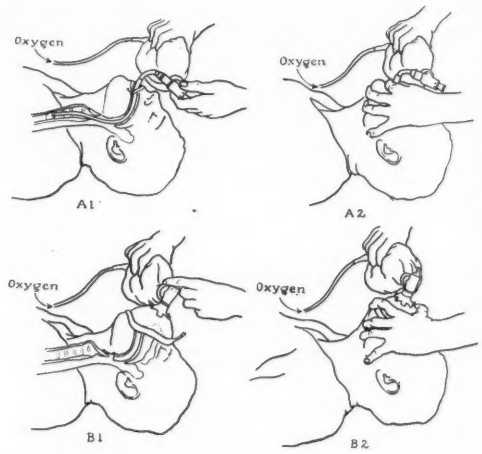


Fig. 3A-B. Intratracheal tube and a bag of oxygen provide the best method of putting oxygen into the lungs (A1 and A2). A face mask and an air way is the next best method. The chin is held up. The pharynx is cleared of vomitus and secretions. (B1 and B2).

do nothing is to be perfect. Death has no spokesman, no one to speak out against the living for improper action or for no action. Indeed, the living are afraid of death and being afraid of death they hate the dead. There is much evidence to support these statements.

Who Should Not Be Resuscitated?—Death may be a release from life in a body-structure scarcely able to live. There are many such instances where incurable disease has run its course, where death is desirable. There are many instances in which the heart cannot support its own beat, when the lungs cannot oxygenate the blood, when the brain cannot co-ordinate its own activity and when the various systems in the body cannot function. Resuscitation should not be tried after the brain has been damaged, after the oxygen-system has been broken for periods longer than six minutes. On the positive side are many instances where it

should be tried—in humans with a good heart and lungs, and whose body is too good to die. Examples are the child who has appendectomy and dies and the man whose heart electrocutes itself and the heart structurally is too good to die (fatal attack of the heart).

Where Can Resuscitation Be Done?—There are certain requirements for resuscitation. The full-equipment of an operating room is not necessary. Only a few items are necessary and if these items are available, resuscitation could be done outside the hospital. Attempts are being made outside the hospital including opening the chest and pumping the heart. These attempts when done by trained personnel and under proper conditions

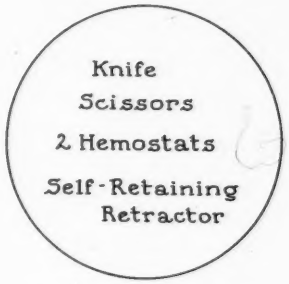


Fig. 4. Equipment to open the chest, kept in a sterile package with the Roswell Park airway and face mask on hospital wards.

are to be encouraged. It is a brave and noble thing to try to save a life and it shows man at his best. Recently a man choked on a piece of meat. Two sons, farmers, cut open the trachea, placed a piece of fountain pen in trachea, saved his life. People can be trained to do these things, even to opening the chest and pumping the heart. Progress will be made in this direction. Victims of fatal heart attacks are being saved in the hospitals. The time will probably come when this will be accomplished outside the hospital.

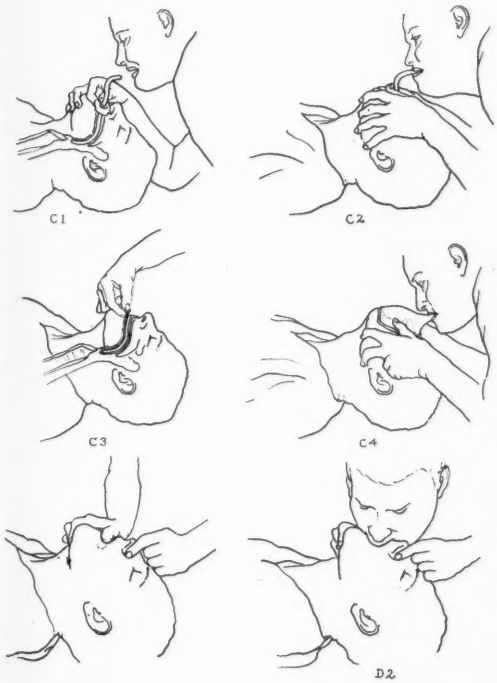


Fig. 3C-D. Inflation of lungs with air. C1 shows a double pharyngeal airway. C2 shows elevation of the jaw with two hands and closure of the nostrils between the two thumbs. The rescuer blows airway. These double airways are in two sizes one for adults, one for children (Safara Airway—can be procured from T. F. Finnigan, 3819 Lancaster Ave., Phila. 4, Pa.). C3 and C4 show a pharyngeal airway and a face mask which covers the mouth and nose and into which air is blown. The jaw is elevated (Breathing mask can be procured from Roswell Park Memorial Institute, Buffalo 3, N. Y.) D1 and D2 show mouth-to-mouth breathing. The thumb of the right hand is inserted into the mouth and the jaw is elevated. The nostrils are squeezed together. Mouth-to-mouth contact is made with thumb in patient's mouth. All food and water are wiped out of the victim's pharynx. These airways should be distributed throughout the hospital. It is advisable for the physician to carry one of these airways in his pocket.

Prevention of Death So Resuscitation Is Not Necessary

This is an important area for proper action. "An ounce of prevention is worth a pound of cure." This applies to the operating room and elsewhere in the hospital and outside the hospital. This subject is too broad to try to discuss in this article. The following items are important: the maintenance of an open airway; stopping the anaesthetic; administration of oxygen; replacement of blood; correction of position of the patient; the Trendelenburg position; good aeration of the lungs; and the use of adrenalin, wyamine, levophed and cedilanid. Tension pneumothorax, cardiac compression, dislocation of the heart, abdominal or gastric distention, intracranial pressure, pulmonary embolus, fluid in chest are items that can lead to death. Preparation for resuscitation is sometimes possible before the patient dies. Things can be gotten ready for action before action is necessary.

The Resuscitation Procedure

The resuscitation procedure consists of two parts. One is restoration of the oxygen-system. The other is restoration of the heart-beat (Fig. 1). One is the emergency act. The other is not. To understand the procedure, this separation must be accepted as "the gospel." Without clear understanding of this, the procedure is likely to be disorderly. Understanding of it produces order and this is a crisis in which there is need for orderly action. To do the wrong thing at the wrong time may cost a life.

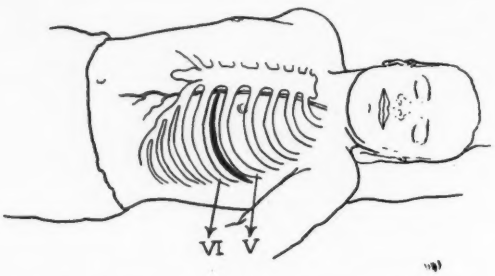


Fig. 5. Incision between two ribs. Time is not taken to count; time is not taken for asepsis. The incision is 8 inches long for an adult and 6 for a child. Location of internal mammary artery is noted. If cut it will not bleed at this time and can be ligated later.

Restoration of the Oxygen-System.—This also consists of two parts. One is to get oxygen into the lungs. The other is to open the chest, pump the heart by hand and circulate the oxygen to the brain. Each will be discussed.

To Deliver Oxygen into the Lungs.—It is possible to be caught short on this without preparation and without equipment and thereby to lose a life. The best way to get oxygen into the lungs is to have a tube in the trachea, to connect the tube to a rubber bag containing oxygen and to squeeze the bag by hand. Every hospital should have a rule that "No surgical procedure, no diagnostic test in x-ray is to be done without required equipment with the patient." This equipment consists of an intratracheal tube, a laryngoscope, a rubber bag and a tank of oxygen (Fig. 2). The intratracheal tube and the bag of oxygen is shown in Figure 3 A1 and A2. A face mask without the tube but with an airway is shown in Figure 3 B1 and B2. The chin must be elevated. The pharynx must be cleared out of vomitus and secretions.

There are other ways of inflating the lungs when the person doing the resuscitation blows air from his own lungs into the lungs of the victim. Figure 3 C1 and C2 shows a double airway; C3 and C4 show a pharyngeal airway plus a face mask which is collapsible and which is recommended; D1 and D2 show mouth-to-mouth insufflation.

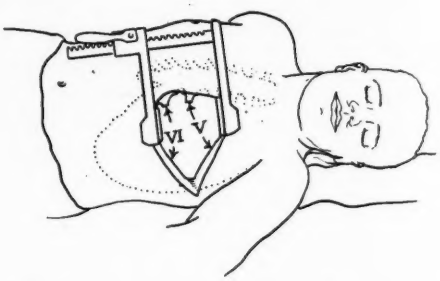


Fig. 6. Two or more costal cartilages are cut across and the ribs are held apart while a hand is placed in the chest and the heart is pumped as soon as possible. A self retaining retractor is placed while pumping proceeds.

These are make-shift methods to be carried out until the methods illustrated in A and B can be brought into use.

Another method which should be mentioned is the use of tracheotomy. This may be life-saving when the patient chokes and the obstruction cannot be removed from the pharynx. It can be done as an emergency by non-medical personnel using a pocket knife and inserting the open end of a fountain pen into the trachea. Since it may save life there is urgency to do it.

To Circulate the Oxygen.—The best way to do this is to open the chest and to pump the heart by hand. The equipment for this is shown in Fig. 4. This can be kept as a sterile package in various areas in the hospital together with the Roswell Park Airway and face mask. This affords essential equipment on wards of hospitals.

Incision.—Time is not taken to sterilize the hands or the victim's chest. It is not taken to count the ribs. The best level is between the fifth and sixth ribs and costal cartilages. It is of no consequence if the incision is one rib higher or lower (Fig. 5). The incision is about 8 inches long for an adult and 6 inches for a child. Two costal cartilages are cut. Ribs are held apart while a

hand is introduced to pump the heart as soon as possible. A self-retaining retractor is a great help and is introduced while the heart is being pumped (Fig. 6). The emergency is now over—provided the lungs are inflated and deflated and provided the heart is properly pumped. The next step can be considered. If this job has been done

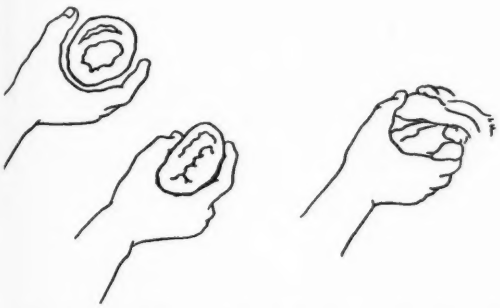


Fig. 7. Illustration on the left shows relaxation of grip to allow filling. It also shows the hand squeezing the empty heart which is to be avoided. The illustration on the right shows the usual grip on a child's heart, using the right hand with the fingers over the left ventricle and the thumb over the right ventricle.

on a medical ward the entire situation is moved to the operating room. The incision is draped with sterile linen and a surgical team takes over the pumping of the heart. A mechanical respirator can be used if one is available. We prefer the Rand-Wolfe Respirator. The lungs should be satisfactorily inflated and deflated in a regular, rhythmic manner. They should come up nicely and go down nicely. Inadequate ventilation may lead to failure. A machine does this job better than the human hand squeezing a bag.

Pumping the Heart.—The heart is pumped by the bare hand as soon as the chest is opened and before the pericardium is opened. There are several points concerning this subject. Both ventricles should be emptied. This means that the right ventricle as well as the left ventricle should be squeezed together. After the ventricles have been emptied the pressure on the heart is completely relaxed so that the heart can fill. It is to be recognized that there is no force to drive blood into the heart. Another point is not to squeeze the empty heart because this only bruises the myocardium. It is possible to stick a finger into the heart or to rupture the heart. A little experience is helpful but good pumping action is possible without experience. The best grip on the heart is to be determined by the person doing it. A child's heart can be pumped by the right hand;

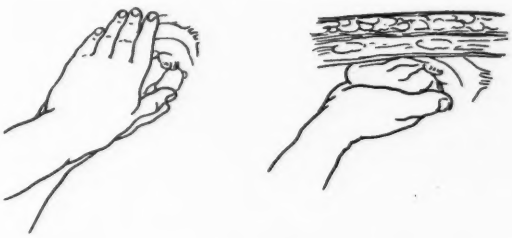


Fig. 8. Illustration on the left shows the adult heart being pumped by the fingers of the right hand over the left ventricle and the fingers of the left hand over the right ventricle. Illustration on the right shows the heart being compressed against the sternum.

the fingers are beneath the heart and the thumb covers the right ventricle. The heart can be squeezed against the sternum. The adult heart is squeezed by both hands; the fingers of the right hand are beneath the heart and the fingers of the left hand are over the right ventricle. These points are illustrated in Figures 7 and 8. It is necessary to have enough room to do a good pumping job on the heart. The chest should be opened as widely as necessary so that the blood can be moved. We have seen an ophthalmologist try to do this through a button-hole incision in the chest and he lost his patient. We have also seen a gynecologist, in gloves and gown, paralyzed into inaction before an operation was started and his patient died. After the heart has been pumped for one or two minutes, time is taken to open the pericardium. The two hemostats and the scissors are prepared for placement in the surgeon's hand so that pumping will be interrupted for as short a time as possible. While he is pumping the heart, he notices where the phrenic nerve is located. He also decides where he is going to grasp the pericardium in the hemostats and where he is going to slit from apex to base. Then he stops pumping and opens the pericardium. Sometimes, if the heart is in standstill, it will start up without opening the pericardium and this is, of course, very good. Pumping is more efficiently done with the pericardium opened.

The crisis is now over. The lungs are inflated. Oxygen is circulated. The blood pressure by pumping is about 80 mm. Hg. A pulse can be felt in the carotid artery with each pumping action

of the hand. The pressure can be raised somewhat by using the index finger of the left hand and compressing the thoracic aorta (Fig. 9). This

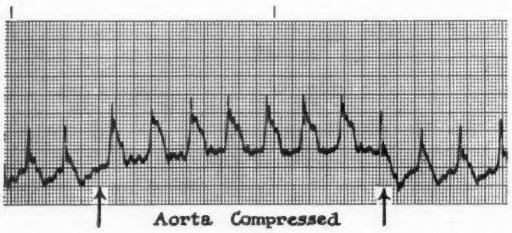


Fig. 9. Blood pressure (in a dog) produced by pumping the heart. It is enough to protect the brain. Pressure is elevated by compression of the aorta.

improves coronary and cerebral circulation. It may be done intermittently. A needle is placed in a vein of the foot for administration of 5 per cent glucose or blood if there has been any blood loss. The circulation should not be overloaded but an adult can take a unit of blood or 500 cc. of glucose solution. Lanatoside C (Cedilanid) is given intravenously in dosage of 2 to 4 cc. or 0.4 mg. or 0.8 mg. This drug is supplied in ampules. It has the same effect as digitalis. It takes effect in about twenty minutes. Ice bags are placed around the patient, between the legs, on each side of the body, and over the neck. Reduction of temperature protects the brain. One must always watch the pumping of the heart and check on the lungs. The oxygen-system must never be needlessly interrupted. The emergency is now over and everyone can relax. Life is no longer in the balance, so to speak.

Restoration of the Heart Beat.—This is Part 2 of the Resuscitation Procedure. It is the easy part, and it is not to be attempted until Part 1 is done satisfactorily. These two parts are not to be confused. Do not be concerned about the heart beat when you are trying to save the brain. From this point on, you can continue to save the brain by carrying out the procedure you so quickly brought into being and you can now concern yourself with the heart beat. The necessary adjuncts are shown in Figure 10. These are two syringes with 22-gauge needles and two medicine glasses containing diluted adrenalin and 1 per cent procaine. There are no other drugs that are any better or as good as these. We have tried them all. These adjuncts can be gotten ready while the heart is being pumped in Part 1. They need not be stand-by equipment as in Part 1.

Ventricular Standstill or Asystole.—Usually the heart starts beating after one or two minutes of pumping. A good heart (without structural disease) wants to beat. Often all it needs is a sec-



Fig. 10. Adjuncts for restoration of the heart beat. No other drugs are as good as these.

ond chance to beat. If it does not start after several minutes of pumping, the pumping is stopped just long enough to observe the heart.

It is interesting that up to this time the heart has not been observed because pumping took precedence over everything else. It is now observed for five to ten seconds. The trained eye can tell whether it is in standstill or fibrillation. For discussion we assume that it is in standstill. An electrocardiogram can be obtained at this point but not before this point. The tone of the heart is determined by the way it feels while the hand pumps it.

If it does not start, the best drug is adrenalin. The assistant gets this ready (4 cc. of the diluted solution) and puts it into a syringe with the needle attached and held properly so that the pumping hand can take it and inject it into the cavity of the right ventricle—not into the the substance of the heart and not into a coronary artery (Fig. 11). This should take but a few seconds. Pumping is immediately resumed. As the drug goes through the lungs, back to the heart, out the aorta and into the coronary arteries the effect on the muscle can be readily felt. The tone improves. Usually it starts to beat. If it does not start to

beat, you check oxygenation of the lungs. They must come up nicely and go down nicely. You check the pumping of the heart and decide whether you are emptying the heart properly. The heart should be nice and pink. If it is not pink, then there is something wrong and correction is in order. If a closed oxygen-system is used, it is

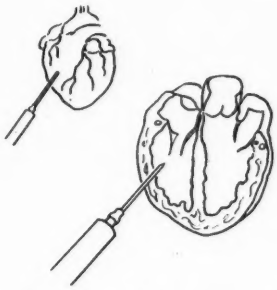


Fig. 11. Administration of drugs into the cavity of the right ventricle. The needle is inserted at an angle. The drug is not injected into the muscle. Coronary arteries are avoided.

possible that the soda lime is not absorbing the carbon dioxide and fresh soda lime should be used. However, almost always the heart starts beating if it is a good heart. Additional injections of adrenalin may be necessary.

Ventricular Fibrillation.—This is characterized by inco-ordinated twitching of the ventricles and resembles the movements of a group of earthworms. It is a convulsion of muscle fibers (Fig. 12). The movement may be coarse or fine. Coarse fibrillation is more favorable than fine fibrillation. The fibrillating ventricles pump out no blood (Fig. 13). Fibrillation of the ventricles must be stopped before the beat can be restored. Occasionally, but not often, fibrillation stops spontaneously.

Occasionally fibrillation occurs when the heart is pumped. The method for stopping fibrillation consists of sending an electric current through the muscle. An electrode about 5 to 7 cm. in diameter is placed on each side of the heart (usually over left and right ventricles but sometimes anteriorly and posteriorly) to shock the ventricular septum (Fig. 14). Ordinary electric light current is used (110 volts). The amount of current is 1 to 2.5 amperes. The current is kept on for about one second. Sometimes repeated shocks in rapid succession are given while moving the electrodes to different areas of the heart.

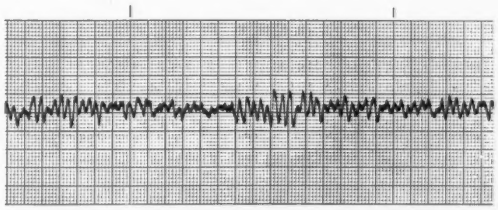


Fig. 12. Electrocardiogram of a fibrillating heart, no co-ordinated complexes.

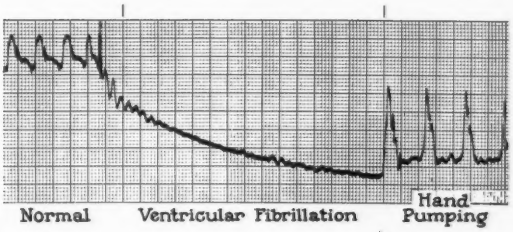


Fig. 13. Blood pressure—normal—during fibrillation—during hand pumping. The fibrillating ventricles pump out no blood.

These shocks also produce contraction of the arms and chest muscles. The electrodes are wet to make good contact. The handles are insulated so that the surgeon does not get shocked. The electrocardiogram is disconnected at the time of shock. The shocking device is special equipment and should be available in every hospital. A few seconds only are taken for shocking the heart. An assistant holds the electrodes so that the surgeon can take them readily, apply them, deliver the shock and resume pumping the heart without delay. If it goes back into fibrillation, several checks are in order. The lungs must come up and go down nicely. The heart should be well oxygenated by proper pumping. If fibrillation continues, 2 to 4 cc. of the adrenalin solution are given. This usually restores tone, improves the color of the muscle and produces a coarse type of fibrillation. Another shock may be effective. If it is not effective, then 4 cc. of procaine are given. This reduces tone and makes the muscle less irritable. Another shock is given.

As a rule the heart comes out of fibrillation readily unless severe disease is present in the heart. The purpose of the shock is to make all muscle

fibers contract at one time with the expectation that they will relax at one time and produce standstill which is followed by a co-ordinated beat.

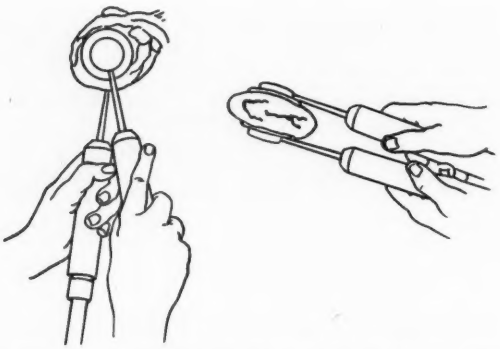


Fig. 14. Application of electrodes to the heart. The heart is emptied of blood by squeezing the electrodes together before the shock is applied.

This beat may be weak and the heart may have to be pumped intermittently. Adrenalin may be necessary. If success is not achieved by the use of adrenalin, procaine and Cedilanid, our experience has been that potassium chloride to abolish fibrillation and calcium chloride or calcium gluconate to restore tone will not be successful.

After the Beat has been Restored.—The pericardium is not closed. A drainage tube is placed in the lower chest and under-water-seal or gentle suction is applied for forty-eight hours. Penicillin and streptomycin are applied to the operative field and instilled into the chest. Antibiotics are given for several days. Bleeding from the wound is controlled. The cut cartilages are removed (leaving the perichondrium) because they may become infected. Closure is by catgut. General anaesthesia may be necessary (Fig. 15).

After Closure of the Chest.—The patient is given oxygen by intra-nasal tube or oxygen tent. The use of ice bags is continued if signs of cerebral damage appear. Pressor drugs may be necessary. Cerebral edema is a complication if the patient does not regain consciousness. Various drugs may be needed as follows: mephentermine, neosynephrine, levophed, atropine, caffeine, hydrocortisone. For cerebral edema and unconsciousness, hypothermia (30° to 34° C.) has been recommended.[1] It has been continued for as long as seventy-two hours. Serum albumin and dehydration may be indicated. Intravenous sedation may be necessary. Digitalis therapy is recommended. An open airway is maintained. Tracheotomy may be indicated. Mechanical respirator (Rand-Wolfe, Drinker or some other device) may be necessary.

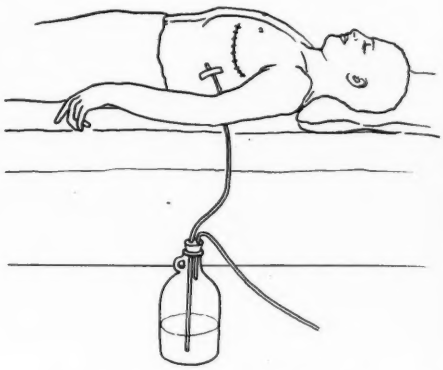


Fig. 15. Closure of the chest. Underwater seal to drainage tube.

Key Points.—Do not wait too long before establishing the oxygen-system. Make sure the lungs come up and go down nicely. Pump the heart correctly. Do not interrupt pumping except when necessary and make the interruption as brief as possible. Demand that your hospital have defibrillation equipment. The absence of such apparatus may be the basis of legal action in the courts. Use drugs sparingly. Maintain an open airway. Use hypothermia and, if necessary, pressor drugs.

Pacemaker and External Defibrillator (Figure 16)

In recent years, there has been discussion in the medical newspapers and journals concerning the value of the pacemaker for resuscitation. It became necessary to demonstrate the pacemaker in our course on resuscitation so that we could determine whether or not it is of value. Our experience has been that it is of no value in starting the heart after the heart has stopped either in asystole or ventricular fibrillation. Even if it is applied directly to the heart it does not produce a beat. The heart becomes anoxic as soon as it stops pumping blood. Sixty seconds of anoxia destroys the power of contraction. The electrical impulse may be present but the muscle will not respond. This is an important point because one

might be led to try it and thereby lose the opportunity for saving a life. The pacemaker is effective in heart block and in the Stokes-Adams syndrome but it has no place in resuscitation of the stopped heart.



Fig. 16. Pacemaker and external defibrillator. Left—The Birtcher Heartpacer, model 230 made by the Birtcher Corporation, Los Angeles, California. Right—The Morris External-Internal Defibrillator, model EID-1 made by the Levinthal Electronic Products, Inc., Redwood City, California. Neither is recommended in the Resuscitation Procedure. Not to pump a stopped heart by hand violates all principles of Resuscitation.

Recently, shocking the heart out of fibrillation by the use of external electrodes on the chest was advocated and many physicians read about its use. Again, we incorporated this into our course and again we found that it had no value in resuscitation of the heart after it stopped in standstill or in fibrillation. This is an old method used by the electric utility companies when a man touches a live wire on a pole. It has had limited value in the past. The electrodes are large. One is applied over the apical region of the chest; the other is applied over the sternum so that the current traverses the heart. Ten amperes and 1,000 volts are used. When a dog's heart is fibrillated by an electric current, the fibrillation is verified by the electrocardiogram. After waiting seventy seconds, an external shock is given. This will defibrillate the heart as shown by the electrocardiogram. It gives the false impression that the heart is beating because the complexes are normal. However, there is no pulsation of the arteries and there is no pumping action of the heart. If the shock is applied before seventy seconds, a pulse might be produced. If the heart is not circulating the blood, all principles of resuscitation are violated if the heart is not pumped by hand. The use of the pacemaker and/or the external difibrillator may be the cause of failure.

Arterial Transfusion.—The question is often asked whether arterial transfusion of oxygenated blood has a place in the resuscitation procedure. The answer is sometimes given in the the affirmative. This, we believe, is the wrong answer. It may have a place only if an artery has been exposed so that the blood can be pumped into the arterial system as is done in Russia. If one has to take time to get oxygenated blood and then put it into an artery (and this may involve cutting down on the artery), the opportunity to save the brain may be lost. If the heart fails to start beating after the blood is given, then this means failure. There is no substitute for pumping the stopped heart. This is no place for experiment and to try any procedure to see whether it works.[2]

References

1. Williams, G. R., Jr., and Spencer, F. C.: The clinical use of hypothermia following cardiac arrest. Ann. Surg., 148:462, 1958.
2. Hosler, R. M. and Wolfe, K.: Open chest versus closed chest cardiac resuscitation. Am. J. Surgery, 97:739, 1959.

Gouty Arthritis

Current Concepts in Treatment and Control

Presented at the Clinical Session of the American Medical Association, Minneapolis, Minnesota, December 5, 1958.

At times, the diagnosis of gout may be difficult to make, but more often it is completely overlooked. Clinical characteristics are most important in making a diagnosis. An elevated uric acid in the blood serum is confirmatory but not diagnostic. Therapeutic response to colchicine is of diagnostic value. Twenty per cent of relatives of gouty patients have elevated uric acid but only one in ten of these may develop acute articular symptoms over a period of twenty years. Thirty per cent of patients have renal disturbances. These facts (and many more) plus a thorough discussion of therapy are to be found in this excellent manuscript.

THE diagnosis of acute gouty arthritis, as well as the prevention of recurring attacks by means of judicious application of the principles of control that are now available, should be the responsibility of the physician practicing general medicine and need not be confined to the internist or to the specialist in joint diseases. Furthermore, scarcely any physician engaged in the general practice of medicine or one of the many specialties is spared the experience of encountering an instance of acute gouty arthritis from time to time. Recognition of the signs and symptoms of a previously undiagnosed case of acute gouty arthritis should result in the prompt institution of measures to alleviate acute distress and subsequently consideration of agents helpful in preventing recurring acute attacks.

Gout and gouty arthritis are not oddities in the practice of medicine. The disease is not a rare one and the greater the awareness of the possibility, the greater the likelihood that the malady will be suspected. The arthritis clinic at the Buffalo General Hospital has been especially interested in gout and gouty arthritis and has taken advantage of this interest in pursuing the various aspects of the malady. Although we have been concerned with two late manifestations of the disease, i.e., critical renal insufficiency and chronic tophaceous gout, respectively, these phenomena have appeared in a small percentage, only, of the patients seen over the years. On the other hand, the major emphasis has been confined to those who suffer neither from critical renal impairment nor from chronic tophaceous gouty arthritis. These comprise the majority of patients in our series.

Until recent years, the tools available to prevent recurring attacks were limited and we were forced, without choice, to concentrate upon the treatment of the acute articular episode. In the post-war years, with the development of new drugs, the pos-

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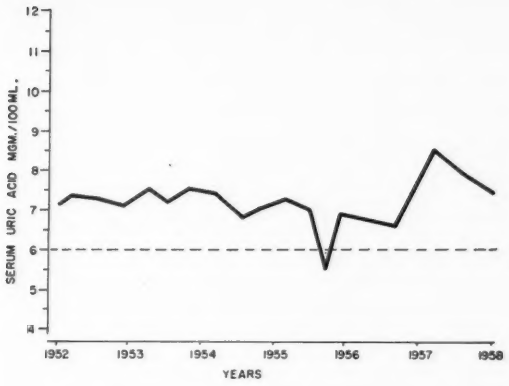


Fig. 1. Concentration of serum uric acid in a patient with mild gout over a period of six years.

From the University of Buffalo School of Medicine and the Buffalo General Hospital.

Studies pursued in this laboratory on the subject of gout were supported in part by a Grant-in-Aid from the National Institutes of Health, Public Health Service, Bethesda, Maryland.

sibility for preventing recurring attacks became factual. At the present time, the ability to prevent recurring attacks, as well as the development of new agents and a better understanding of agents already available for the treatment of the acute episode, have been responsible for a more adequate control of this form of arthritis than any other type of chronic articular disorder.

There are several terms to be defined in this discussion. *Gout* is the basic term without reference to acute or chronic joint distress. It is justified in any individual who has suffered one or more attacks of acute gouty arthritis. The only demonstrable abnormality between attacks in such an individual may be the increased concentration of uric acid in the serum and related disturbances of uric acid metabolism that are detected only by precise and complicated research devices. These devices include the volume of the metabolic pool of uric acid and the abnormal pathways of uric acid, techniques which require complicated chemical procedures with radioactive or stable isotopes. *Acute gouty arthritis* requires no comment at this point. The period between the attacks of acute gout has been designated the *intercritical period.* In recent years, the term *prophylactic period* has been preferred because it emphasizes the value of the regimen which inhibits or prevents recurring acute episodes. *Chronic gouty arthritis* or *chronic tophaceous gout* refers to the layman's concept of the malady but is applicable to a small percentage of patients only. Several decades usually elapse following the first articular episode before the development of this stage. Most important is the observation that gout need not be a chronic progressive disease if current principles of management are followed and the incidence of chronic tophaceous gout should dwindle to clinical insignificance in the years ahead.

The designation, *gouty diathesis* should be abandoned or redefined. We use it only in relation to the phenomenon intimate to metabolic gout.

Coronary vessel disease, generalized arteriosclerosis, gastrointestinal symptoms, cutaneous disorders and other clinical findings sometimes seen in patients with gout, are not believed to be part and parcel of the malady. Their incidence is no higher than in a similar group of non-gouty individuals. The appearance of acute articular symptoms or chronic gouty arthritis sometimes follows a blood dyscracia with a prolonged natural history such as, polycythemia vera, myeloid metaplasia, or chronic myelogenous leukemia, among other conditions. The development of clinical gout under such circumstances has been identified as *secondary gout* by Gutman.[1] The clinical findings may be indistinguishable from the more usual type of gouty arthritis; likewise the treatment is similar and should be enforced in addition to those measures employed for the handling of the blood dyscrasia. Terms *urate* and *uric acid* are used interchangeably in this discussion. The former term is preferred since the acid exists in body fluids in equilibrium with a base. General usage however, supports the retention of the term uric acid. A *uricosuric agent* is one that enhances the excretion of uric acid from the body. Metabolic gout, primary gout or familial gout are synonomous.

Heredity.—Gout is a familial malady and the greater the zeal with which one pursues familial incidence the higher the value. In our series we have obtained a positive family history in three out of four of the afflicted. A positive family history should be of some help in suspecting the diagnosis in a patient with unidentified joint distress. Also, for a number of years we have studied the serum uric acid concentration in relatives of gouty patients. Approximately 20 per cent of the next of kin will have an increased concentration of uric acid in the serum without other clinical or laboratory evidence of gouty arthritis. During the period of more than two decades that we have been collecting familial statistics, the development of an acute articular episode in a non-affected relative with an increased concentration of uric acid in the serum has been less than 5 per cent. The chemical abnormality in non-affected relatives is not viewed with alarm, therefore, and no treatment is suggested until after the first attack of acute gouty arthritis.

There are several items that may appear in the patient with gout prior to the first attack. Uric acid stones have been passed in two instances ten years or more before the first attack of acute gouty arthritis. Transient albuminuria has been reported as well as a modest elevation of blood pressure. Since one patient in seven with clinical gout will pass one or more renal stones during the natural history of the malady, it is not surprising that occasionally a patient will be troubled with this complication prior to the first articular attack. Albuminuria and a modest elevation of blood pressure are observed in a somewhat larger number of gouty patients and in a few instances they may precede the initial symptoms which suggest the diagnosis. The pathogenesis of these manifestations is believed to be related to the basic fault, that is, an increased formation of uric acid by the body and an increased transport of uric acid through the kidneys which insults, to a limited degree, the renal parenchyma.

Mortality.—Mortality data in gouty patients have been held within the bosom of life insurance actuarians with the implied, if not adequately documented, concept that mortality is higher than normal controls. On the other hand, it has been my firm belief that, except for patients with critical renal insufficiency, mortality in gouty patients is not increased. Recently we have reviewed the mortality figures from fifty-four patients who were followed in Boston in the 1930's as well as 114 patients who were seen at the Buffalo Veteran's Administration Hospital between 1948 and 1958. The living and the dead data of these two groups were compared with a controlled series of non-gouty persons. The data were subjected to critical analysis by Dr. Abraham Lilienfeld of the Johns Hopkins School of Public Health. It was concluded that the mortality in gout is not unlike the mortality of the non-gouty control.[2]

Diagnosis

The clinical characteristics of the acute attack are most helpful, in our experience, among the several criteria. I would place greatest emphasis upon the clinical features of the acute episode if I were forced to rely upon one diagnostic feature only. These may be observed by the physician at the time of the attack or they may be recounted in the symptom-free period if the patient has been a critical observer. The cardinal signs of inflammation, redness, swelling, heat and tenderness may be

accompanied by an elevation of body temperature, a leukocytosis and an increase in the sedimentation rate. The acute attack usually develops suddenly in a previously healthy individual, sometimes during the day, but more often during the night. Although the acute attack characteristically is sudden in onset, instances have been observed in which the onset was insidious in development and did not reveal the characteristics that sometimes confuse acute gouty arthritis with a septic joint or a traumatic joint. Partial or complete loss of function of the affected joint or joints in the untreated case is the rule. Rheumatoid arthritis and osteoarthritis, two other types of joint disease frequently encountered in the middle-aged men, are not associated with sudden and severe distress. On the other hand, acute rheumatic fever may simulate acute gouty arthritis and poses a difficult diagnostic problem, particularly in the young male. Either malady may be both migratory and polyarticular. The metatarsal-phalangeal joints of the great toe is the classical joint involved in gouty arthritis and approximately one-half of the patients will experience acute distress in this joint during the initial episode. The bunion joint is exquisitely tender and street shoes cannot be worn with comfort. Inspection of the shoe or slipper may reveal an operation upon the medial aspects or even removal of a portion of this invention of modern civilization, hence, the designation "gouty shoe."

The concentration of uric acid in the serum is of considerable help in diagnosis, but the datum should be interpreted cautiously. Serum rather than whole blood is preferred for the determination. The technical procedure in the biochemical laboratory is not always reliable and unless the biochemist is familiar with the possible sources of error in the determination, a false or equivocal value may be reported. Most procedures utilize the development of color which is subjected to interference by a number of substances. A false, normal value may be reported if a patient has ingested one of a number of anti-arthritic drugs within a forty-eight-hour period prior to the collection of the serum for the determination. It is interesting to note that many anti-arthritic agents, whether prescribed by the physician or ingested at the discretion of the patient as a home remedy, are uricosuric. Salicylates, phenylbutazone, and the adrenal steroids cause depression of the uric acid concentration and confuse the interpretation. Thus, it is desirable to wait forty-eight hours after the administration of any analgesic or any anti-rheumatic agent before collecting the serum for diagnostic interpretation.

Colchicine is the only specific anti-gout agent that has no recognized effect upon uric acid metabolism. One need not, therefore, withhold colchicine before collecting serum for chemical analysis. The upper limit for serum uric acid in males is 5 mg. per 100 ml. and the lower range for gouty males is 6 mg. In females this range may be slightly lower and clinical gout has been observed in females with a serum uric acid level not greater than 5.5 mg. It should be noted also, that a few non-gouty persons may have a serum uric acid level in the gouty range. The incidence of such hyperuricemic non-gouty males is sufficiently high to justify caution in basing a diagnosis largely upon the concentration in the serum. The serum level should be used to confirm a clinical presumptive diagnosis rather than to establish the diagnosis in the absence of characteristic clinical features. Save for the abstinence from anti-rheumatic agents there is no ideal time, in relation to acute symptoms, to collect the serum for the determination. There may be slight fluctuations in the level of uric acid in the serum of gouty patients but in the main it can be assumed that if the patient is suffering from gout the concentration of uric acid in the serum will be elevated before the attack, during the attack and after the attack.

Roentgenographic changes, save for soft tissue swelling, should not be expected until after the disease has been evident clinically for a number of years. It is believed that a significant quantity of uric acid must be deposited in bone or cartilage before roentgenographic changes appear. Such findings are characteristic of the well-developed stage and a number of attacks usually have preceded the development of this diagnostic finding. A similar statement may be made for subcutaneous tophi. It is unusual, in our experience, to find tophi in the ears or tophi in periarticular areas at the time of the initial episode.

The use of colchicine as a diagnostic as well as a therapeutic tool has great merit. When a presumptive diagnosis of gouty arthritis is entertained, it is unnecessary to wait for the laboratory to report the serum uric acid level or the interpretation of the x-rays of the affected parts. Specific therapy should be instituted without delay if gout is suspected. Colchicine is the only specific anti-gout

agent and has no recognized action in other types of joint disease. The response to colchicine whether given orally or intravenously may be extremely valuable in confirming the diagnosis as well as in alleviating joint distress. Colchicine should be prescribed orally, 1 mg. every two hours, until the onset of nausea, vomiting or diarrhea. It is imperative to prescribe a full course of colchicine up to the point of gastrointestinal irritation, irrespective of whether diagnostic or therapeutic aid or the combination is sought. Usually the side action is apparent after the ingestion of not more than from 4 to 6 mg. of colchicine. It is equally important that the drug be discontinued at the first sign of gastrointestinal irritability, at which time a gastric sedative, tincture of paregoric, is prescribed and repeated every hour, as indicated. If intravenous colchicine is preferred 2 mg. of colchicine may be given at three-hour intervals for two or three doses with similar results upon joint distress without undesirable gastrointestinal features.

Precipitating Factors.—Although a number of precipitating factors have been implicated in the acute articular episode, we have no knowledge regarding the exact mechanism of the distress. Infiltration of cartilage and subchondral bone by urates surely precedes the first attack. Once the joint structure has been invaded the urates persist save for prolonged administration of uricosuric agents.[3] The possibility of an acute attack meanwhile is ever present. Increased precipitation of uric acid crystals preceding or during the acute attack has not been proved. Probably the precipitation is no greater during the acute attack than at other times. The polyarticular nature of many of the severe bouts suggest a systemic disturbance rather than an exclusively local one. Except for secondary changes attributed to inflammation, the physical appearance of articular tissue at the time of the acute attack is believed to be similar to that in the intercritical period. Nor is the pathogenesis of the acute attack in secondary gout dissimilar from familial gout. When uric acid crystals are present in articular structures, the possibility of an acute attack is present: why, we do not know. Trauma to a joint, mild or severe is a common precipitating factor. The diagnosis of a strain or a sprain is more apt to be entertained than that of acute gouty arthritis. If the knee is the joint affected a large synovial effusion is a real threat. It is our practice in patients with known gout to treat a strain or sprain, irrespective of whether it follows injury as if it were an attack of acute gouty arthritis. The results have been rewarding and not disappointing.

The incidence of acute gouty arthritis following a surgical procedure, mild or severe is significant. Because of the incidence of postoperative gouty arthritis it is our practice to recommend 1.5 mg. of colchicine daily, three days before the surgical procedure and three days postoperatively. If the operation is a major one, colchicine is administered intravenously following surgery. Other precipitating factors include over-indulgence in food and alcohol, an acute infection, minor or major blood loss, emotional trauma and exposure to the elements. There are several drugs that deserve mention as precipitating agents, usually when administered intravenously. These include penicillin, the B vitamins and mercurial diuretics.

Pathogenesis.—The pathogenesis of the metabolic defect in gout is believed to be on firm ground as a result of investigations during the past decade. The increased concentration of uric acid in body fluids and the increased excretion in the urine in a limited number of patients is believed to be caused by an increased formation by the body. The destruction by the human organism of significant quantities, by an enzyme system including uricase, is not of sufficient magnitude to explain the metabolic findings. The concentration of uricolytic ferments in human tissue is not high; nor has diminished excretion of urates by the kidneys been substantiated by unequivocal data.

Dr. Bishop of our laboratory[4] has recently reviewed renal excretion data collected from several laboratories. He has concluded from this review that a renal component cannot be excluded. If there is impaired excretion by the kidneys in gouty patients, there must be tubular excretion of uric acid as well as tubular reabsorption. The former has not been proven but an open mind must be maintained regarding this possibility. Renal clearance studies of uric acid remain normal except in the terminal stages of a minority of patients who have renal insufficiency late in the course of the disease. Most of the afflicted, irrespective of the stage of the disease, show a normal clearance of uric acid and do not show a general or selective inability to excrete this substance. It is believed

that kidney involvement, when it does appear, is secondary to the metabolic fault and is not intimate to the primary dysfunction. The increased formation hypothesis appears to have most data to support it. A few patients with gout will excrete from twice to fourfold the quantity of uric acid in the urine when comparison is made with the non-gouty control.[5] This suggests an increased formation of uric acid by the body. The non-affected relatives[6] with an increased concentration of serum urate provides additional evidence. Lastly, convincing support has come from investigators in several laboratories who have demonstrated an increased formation of uric acid in gouty patients using glycine labeled with radioactive or stable isotopes.[7]

Blood Dyscrasias and Gouty Arthritis.—The number of blood disturbances that may be responsible for clinical gout is considerably higher than I had assumed prior to a review of the literature and a critical analysis of the patients in our series.[8] The development of clinical gout in patients with polycythemia vera, chronic myelogenous leukemia and myeloid metaplasia has been described in the literature repeatedly. The clinical course of the blood dyscrasias usually has been a long one. The increased turnover of nucleic acids with increased concentration of uric acid in the serum has been held responsible. There are two features in secondary gout that are increased when comparison is made with those suffering from familial gout. The incidence of uric acid stones is higher as well as the concentration of uric acid in the serum. In each category, the aberrations are related to increased turnover of nucleoproteins. The highest serum uric acid values, in our experience, are observed in patients with a blood dyscrasia. Values in the 20's and 30's are not unusual; we have observed a few patients with a serum uric acid level greater than 40 mg. per 100 ml. The incidence of blood disturbances in our series is slightly more than 5 per cent. This value should serve to emphasize a critical scrutiny of the possibility of an underlying blood disturbance in any patient with gout, particularly the patient with a serum uric acid concentration above 10 mg. Also, in the very young patient, a blood disturbance may be responsible for the development of clinical gout. In the late 1920's and early 1930's when whole liver was used in the treatment of pernicious anemia, a number of cases of gout were revealed. Other disorders that have been associated with secondary gout include; thalassemia, multiple myeloma, Waldenstrom's hyperglobulinemia, sickle cell anemia, Hodgkin's disease, reticulum cell sarcoma, lymphatic leukemia, giant follicular lymphoma, chronic erythronoclastic anemia and lead intoxication.

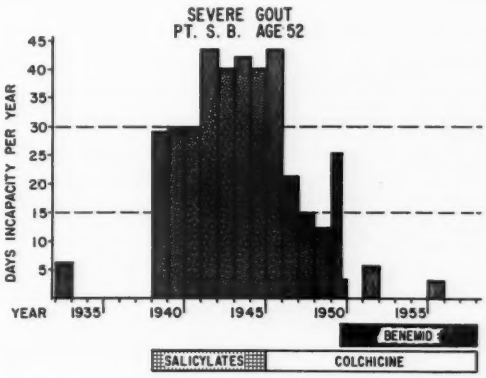


Fig. 2. Incidence of acute attacks of gout over a period of twenty-five years.

Treatment

Colchicine is the drug of choice in the acute attack, irrespective of whether the diagnosis has been confirmed or is merely suspected. It is our practice to prescribe a "full course" of colchicine as noted previously under diagnosis. If the diagnosis has been established and one does not seek confirmation, the treatment of the acute attack may be modified by the prescription of sub-maximal doses of colchicine combined with one of two general anti-arthritic agents. If less than the full therapeutic amount of colchicine is prescribed, (3-5 mg.), 400-800 mg. of phenylbutazone may be recommended daily for two or three days. There are some rheumatologists who prefer to use phenylbutazone, exclusively, in the management of the acute attack. In such circumstances, from 400 to 800 mg. of the preparation is prescribed daily for two or three days. If the acute attack has been untreated or poorly treated for one or more days, more rigorous medication is indicated. In addition to a full course of colchicine, supplementary phenylbutazone or supplementary ACTH is recommended. If the latter agent is prescribed, from

60 to 80 units of ACTH-gel is given for two days. Intravenous colchicine also has a limited but definite place in treatment. During convalescence from acute gouty arthritis, early ambulation is urged. There are no other specific measures recommended for the treatment of the acute episode. General measures include consumption of an abundance of fluid, protection of affected joints, and a diet to suit the patient's wishes.

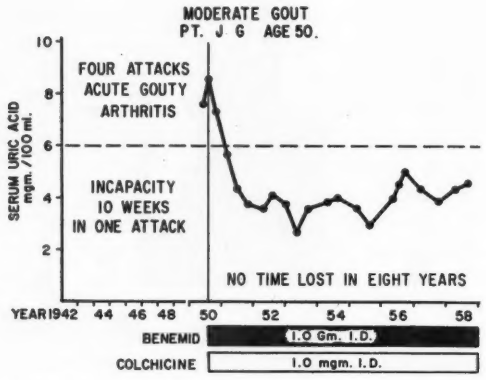


Fig. 3. Effect of the prophylactic regimen upon incidence of acute attacks of gout.

The interval between attacks varies considerably. Several years may elapse in a person mildly afflicted. The patient with moderate or severe gout may experience several attacks per year if adequate treatment is not recommended. Patients who develop tophi sometimes represent a more severe form of the malady and are prone to suffer a higher incidence of acute attacks and greater incapacity per year unless prophylactic therapy is followed. On the other hand, there are some patients with chronic tophaceous gout whose disease appears less critical than during the early stages. Between the acute attacks, in patients without articular deformities, there are no subjective symptoms or objective findings save for the chemical abnormalities in the body fluids. The prophylactic regimen recommended for the inter-critical period embodies the combination of colchicine and a uricosuric agent with excellent clinical results. The majority of gouty patients are eager to follow the regimen and, in return, are permitted to live normal lives and pursue a gainful occupation. An optimistic prognosis was expressed a number of years ago through the prophylactic use of colchicine daily.[6] The future for gouty patients has been further enlightened by the development of uricosuric agents. The one that we have had the most experience with has been probenecid. This powerful pharmacologic agent was designed to inhibit the excretion of penicillin from the body. It was noted initially that it was endowed with uricosuric properties as well. Probenecid has been available for more than eight years and the longer the drug is used, the more convincing the clinical observations and the greater the reliance placed upon it. Furthermore, the toxicity of the drug is low, probably not greater than is observed in the use of pharmacologic quantities of salicylates.

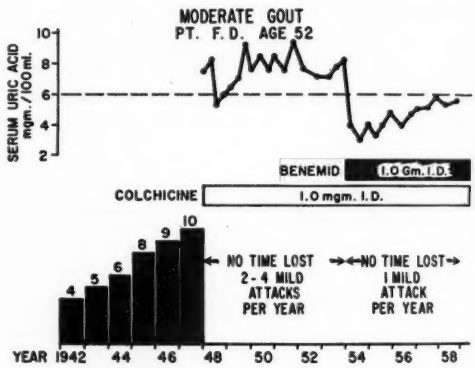


Fig. 4. Incidence of acute attacks of gout as a function of medication.

If the prophylactic regimen is respected, acute attacks should be infrequent in incidence and the patient should be symptom-free save for possibly a few days per year because of minor articular distress. Although the acute episode is a miserable affair if allowed to reach full proportions, proper respect for prophylactic agents will reduce the incidence of acute bouts to clinical insignificance and will either stay or reverse the previously progressive efforts of the disturbance of uric acid metabolism. The value of the combination of two drugs in the prophylactic regimen has been amply substantiated. Colchicine used with a uricosuric agent gives a complimentary effect. There is no overlapping of pharmacologic action. Neither one by itself is as effective as is the combination. Other anti-gout agents may be disregarded if colchicine and a uricosuric agent of low toxicity are taken

daily. Although no effect upon uric acid metabolism has been ascribed to colchicine, the daily use of this preparation in the prevention of recurring attacks has been proven by experience. It is believed to be a sound practice for each patient with moderate or severe gout to take some colchicine daily. If the patient suffers not more than one acute attack per year, one tablet of colchicine 0.5 mg. is recommended daily. Patients severely afflicted are advised to take two or three colchicine tablets each day of the year. Those with chronic tophaceous gout and frequently recurring attacks of acute gouty arthritis, are advised to take colchicine daily up to the point of gastrointestinal tolerance. In some patients this may be as many as four tablets per day. The incidence of acute attacks was reduced significantly through the prophylactic use of colchicine prior to 1950. Since then, a significant further reduction in the incidence of acute attacks and an improved state of well-being has been ascribed to the addition of a uricosuric agent. Tolerance does not develop to colchicine when taken daily and if a full course is needed to combat acute symptoms, irrespective of previous prophylactic ingestion, the pharmacologic action may be demonstrated. A number of patients in our series have taken colchicine daily for more than twenty years; a larger number have taken this drug daily for a decade. No delayed effects or untoward, undesirable actions has been demonstrated.

The addition of a powerful uricosuric agent, probenecid, to the prophylactic regimen in 1950 enhanced the value of colchicine. Our clinical experience has been satisfactory with a dosage of probenecid of 1 gm. daily for the moderately severe patient. The patient mildly afflicted may obtain thoroughly satisfactory results with 0.5 gm. of probenecid daily. No attempt is made to titrate probenecid dosage with levels of uric acid in the serum. There is sufficient fluctuation of the concentration of serum uric acid to make titration unreliable. The above-noted rule of thumb has been proven by experience to be thoroughly satisfactory. Essentially the same number of probenecid tablets are taken daily as colchicine in the mild or moderately severe case.

Rigid restrictions upon habits, good or bad, are not imposed. The patient is encouraged to eat a balanced diet, drink an abundance of fluids, and pursue any physical activity that suits his fancy. Only those items high in purine substances, such as liver, kidney, sweetbreads and anchovies are prohibited. An occasional patient may note a worsening of the disease process following the ingestion of a particular item of food. Under such circumstances the implications are obvious. Otherwise, a balanced diet is recommended. A high fluid intake is necessary in order to provide for the increased excretion of uric acid in the urine under the influence of a uricosuric substance. Since the solubility of uric acid in the urine is near the upper limit of normal, an augmented uric acid excretion should have a similar increased amount of fluid available for transport. Alcoholic beverages are permitted in keeping with the social practices of the afflicted.

The patient becomes neither tolerant nor intolerant to probenecid. The increased loss of uric acid from the body following ingestion of probenecid persists so long as the drug is taken. When the agent is stopped, there is a prompt return to the pre-probenecid level with the reversion of the serum uric acid concentration. This does not imply that the benefits during probenecid therapy have been nullified, but rather that the disturbance is a chronic one and with cessation of ingestion the re-accumulation of urates in tissues begins anew. The toxicity of probenecid is low. It was our impression, originally, that there was a slightly increased incidence of acute attacks during the first few weeks or months after beginning the drug. This impression has not been confirmed with a longer experience. Neither bone marrow depression nor liver damage has not been reported. A few instances of hypersensitivity have been observed. Usually this phenomenon may be corrected with administration of appropriate anti-histaminic agents. The incidence of renal stone in patients with gout, irrespective of the administration of a particular uricosuric agent, is significant. In our series, however, the incidence of renal stones has not increased with adherence to the prophylactic regimen. Comparison has been made of the incidence of stones over a seven-year period on probenecid with a similar period prior to 1950. The incidence in each series is essentially the same —17 per cent. Probenecid is a mild gastrointestinal irritant if taken in full therapeutic amounts on an empty stomach. Such distress may be prevented by the ingestion of the drug with meals or the concomitant ingestion of a mild gastric sedative.

A number of patients have been on probenecid and colchicine daily since 1950, who recounted a previous history of moderate or severe gouty arthritis and had lost weeks or months from work each year prior to the institution of the therapeutic regimen. In recent years they have suffered little or no incapacity from gout. A majority of our patients, irrespective of the severity of the disease, average less than one day per year of incapacity because of acute articular distress. This represents a striking change from the period before the institution of the regimen. It should be appreciated that probenecid is of no immediate value during the acute articular bout. When such an event develops, it is unimportant whether probenecid is omitted or not for a few days. It should be resumed, however, once the acute distress has subsided.

The length of time that a patient should be on the combined regimen has not been determined. It is our prediction that patients severely afflicted with gout will remain on probenecid and colchicine daily throughout the natural history of the disease. Those persons moderately or mildly afflicted are permitted considerable freedom. Patients with moderate gout may revert to a somewhat lower dose-schedule per week after the recommended quantities have been taken regularly for two or three years. Since the escape from probenecid is rapid, a person moderately afflicted should not remain off of the uricosuric agent for any significant length of time. Gout is a chronic disease and the disturbance of uric acid metabolism persists as long as the patient lives. The threat of an acute attack remains because of the continuing increased formation of uric acid by the body.

Summary

There are several features of gout and gouty arthritis that have been stressed in this presentation. A presumptive diagnosis of acute gout should be entertained in any unexplained acute inflammation of one or more joints, particularly in a man. The family history regarding the malady is significant as is the number of relatives of gouty patients having no clinical history of gout but who are found with an increased concentration of uric acid in the serum.

The clinical features of the acute attack, which embody cardinal signs of inflammation, are probably the most helpful criteria in the diagnosis. Confirmation rests upon the prompt response to a full course of colchicine and probably the revelation of an increased concentration of uric acid in the serum. The pitfalls of relying upon the concentration of serum uric acid, alone, has been discussed. Roentgenographic evidence in the earlier years of the disease may be confined to soft tissue swelling at the time of the acute attacks. The finding of the classical "punched-out" areas in the subchondral spaces is a late—not an early—manifestation of the malady.

The pathogenesis of the acute episode remains to be determined. The pathogenesis of the underlying metabolic disturbance is concerned largely with the increased formation of uric acid by the body. Diminished destruction is not believed to participate. Impaired excretion by the kidneys has been the subject of considerable attention over the years and probably does not play a major role. This mechanism may contribute to a minor degree, however.

Participating factors should be appreciated. These include: surgical intervention, an acute infection, local trauma, emotional stresses and selected drugs administered parentally.

The mortality in gout was not abnormal in two series of patients followed for as long as twenty-five years. The prognosis is excellent if the prophylactic regimen is accepted. This involves colchicine and a uricosuric agent (probenecid) administered daily for moderately or severely afflicted patients and less often to those mildly afflicted.

In substance, gout and gouty arthritis are amenable to management with currently available therapeutic agents.

References

1. Gutman, A. B.: Primary and secondary gout. Ann. Int. Med., 39:1062, 1957.
2. Talbott, J. H., and Lilienfeld, A.: Longevity in gout. Geriatrics, 1959. (In press.)
3. Talbott, J. H.: Gout. New York: Grune & Stratton, 1957.
4. Bishop, Charles: Renal function in gout. (In preparation).
5. Coombs, F. S., Pecora, L. J., Thorogood, E., Consolazio, W. V., and Talbott, J. H.: Renal function in patients with gout. J. Clin. Invest., 19:525, 1940.
6. Talbott, J. H.: Gout. New York: Oxford University Press, 1943.
7. Wyngaarden, J. B.: Intermediary purine metabolism and the metabolic defects of gout. Metabolism, 6:244, 1957.
8. Talbott, J. H.: Blood dyscrasias and gout. Medicine, 1959. (In press.)

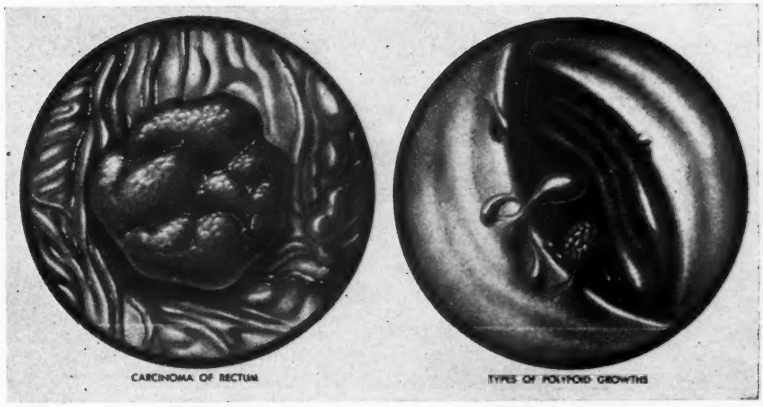


Fig. 1. The sigmoidoscopic views of various stages of growth of adenomatous polyps and an early polypoid adenocarcinoma.

Early Diagnosis and Treatment of Rectal and Sigmoid Colon Neoplasms

● With the experience at the University of Minnesota Cancer Detection Center as a starting point, the authors discuss techniques for detection and treatment of the small and early neoplasms of the lower large bowel.

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CANCER Detection Centers at the various medical centers in this country, have now been in operation long enough to yield statistics which should convince even the most skeptical critic that a similar program of detection is a "must" in every general physician's office. The University of Minnesota Cancer Detection Center[1-3] has been in operation ten plus years. During this period, approximately 9,000 patients have received 31,000 examinations. In the actively examined group, 288 cancers have been found. The instance of precancerous lesions is 55.6 per cent. The over-all survival rate of patients whose cancers were found at the center is 68 per cent. Survival in the asymptomatic group is 76.9 per cent, while that in the symptomatic group is 53.2 per cent.[4] In lesions of the gastrointestinal tract, there is approximately a three-fold increase in survival of the presymptomatic group over the symptomatic group.[1,5,6] Surely no physician can deny his patients the advantages of early precancerous and cancer detection after reading these figures.

TABLE I. PRECANCEROUS LESIONS
(University of Minnesota Cancer Detection Center, 1957)

Rectal and colon polyps	2,386
Leukoplakia	589
Senile keratoses	573
Irritated pigmented nevi	394
Thyroid adenomas	240
Kraurosis vulvae	57
Gastric polyps	39
Vocal cord polyps	1
Total	4,279
Total patients	8,229

The most prevalent precancerous lesions reported by the various centers are *adenomatous*

polyps of the rectum and colon. The various incidences reported range from 10 to 15 per cent of those patients examined over the age of forty-five years.[5] The proctosigmoidoscope is, of course, the means of establishing these lesions. Most general physicians should master the technique of its usage because the rewards will be great in the number of precancerous, as well as cancerous, lesions that they will pick up and in the personal satisfaction that they will gain by giving their patients a more thorough examination. Every patient forty-five years of age or older should be given the benefit of a proctosigmoidoscopic examination regardless of symptoms if he requests a thorough physical examination. In fact, physicians should take it upon themselves to recommend this examination more frequently to members of this age group since 75 per cent of the benign and malignant colonic lesions can be visualized with the 25 cm. sigmoidoscope.

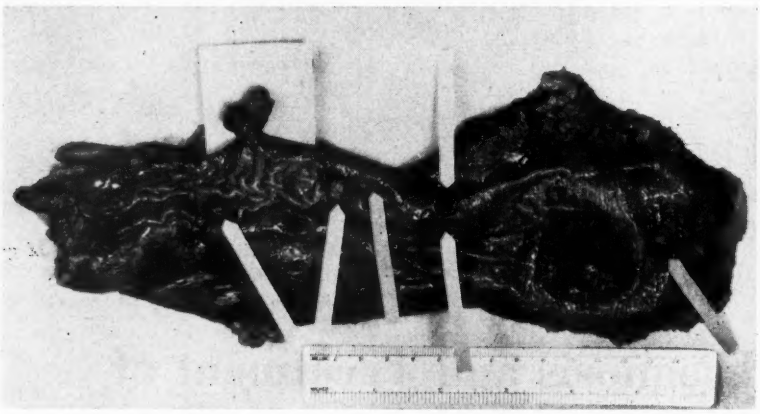


Fig. 2. Polypoid adenocarcinoma of the sigmoid colon with adjacent adenomatous polyps.

TABLE II. PROCTOSCOPY AIDS

1. A clean bowel is essential. The use of any of the hypertonic solution enemas the night before and morning of examination usually produces a clean bowel with a minimum of effort for the patient. Most patients are starved the day of examination.
2. Do not advance the scope unless you can see the bowel lumen.
3. Lift scope with left hand to straighten the lower sacral curve of the rectum, and withdraw slightly to look for lumen when in the blind rectosigmoid pouch.
4. Concentrate on advancing scope painlessly without air, if possible; examine bowel carefully with air inflation as scope is withdrawn.
5. Do not attempt to scope to the "hilt" those patients with fixation and angulation. Remember large diverticulae can be perforated with air inflation.

There are some hazards in the use of the proctosigmoidoscope of which the examiner must be aware of: namely, bowel perforation and undue traumatization of the bowel. Here it might be well to mention several aspects of the technique of performing an uncomplicated examination.

Adenomatous polyps have a characteristic appearance (Fig. 1). Their exact nature may be established by biopsy. The most frequently confused lesions among the small adenoma group are small submucosal nodules, usually lymphoid aggregates, and early carcinoid tumors. These lesions are of rather infrequent occurrence but must be suspected when there is any slight variation from the usual appearance of an adenoma. A recent survey of 1000 adenomas 4 mm. or less in diameter reveals the histology in every instance to be benign. However, five of the lesions were reported as carcinoids. The lesions were biopsied by resident physicians who reported them grossly, as adenomatous polyps. However, I am sure that it would have required the eye of an experienced proctologist to call them otherwise. Early carcinoids do appear much as submucosal lymphoid aggregates with fairly normal mucosal surfaces. We feel justified in destroying small adenomas of the rectum and sigmoid colon by electrofulguration without biopsy if the lesion is 2 mm. or less in diameter.

Rarely will carcinoids be included in this group; however, fulguration is adequate treatment at this

stage of their growth. Troublesome bleeding may interfere with fulguration of these small lesions if biopsy is attempted first. If there is any doubt as to the benignancy of the adenoma, as may be the case with the inexperienced examiner, he should by all means biopsy the lesion first and complete the destruction of it with fulgurating current at a subsequent visit. It might also be wise to advise the beginner at electrofulguration to limit his activity to the posterior wall of the rectum or the area below the peritoneal reflection until he calibrates his machine in the extent of tissue destruction. Remember bowel perforation by electrofulguration is always a possibility, particularly when followed by a procedure that produces increased intracolonic pressure, such as enemas and barium enema studies, even as late as two to three weeks after the fulguration. By all means avoid barium studies for at least a three-week period after fulguration of even the 1 to 2 mm. adenomas.

If multiple polyps are visualized at proctosigmoidoscopic examination, an air contrast barium enema should be ordered prior to fulguration. These patients are best handled in the hospital (Fig. 2). Pedunculated polyps and larger sessile lesions below the peritoneal reflection are generally quite amenable to excision with the fulgurating snare. This is a tremendously valuable instrument in the hands of an experienced operator. We have excised large pedunculated polyps 40 cm. from the anal verge and have similarly removed large sessile villous papillomas that encircle more than one-half the bowel with this instrument, but, of course, not without some trepidation. However, we can see no excuse for performing a colotomy with the open bowel excision of a polyp that is located below the 30 cm. level when a proctologist, experienced in snare fulguration, is available for consultation. Not infrequently, higher lesions can be extracted when the sigmoid colon can be straightened to allow the passage of a 40 cm. sigmoidoscope. The fulgurating snare is useful in the doctor's office for the excision of smaller pedunculated polyps and may also be used to obtain liberal biopsies of vascular carcinomas.

Congenital polyposis of the colon is an entity deserving detailed discussion elsewhere. However, once the diagnosis is established from the history, the air contrast barium enema studies and the sigmoidoscopic appearance of the distal colon (studded with from a score to literally thousands of adenomatous polyps), then the tedious job of preparing the rectum for ileal anastomosis can be undertaken. This in our experience should be done over a period of time with several office visits. At each visit the patient must be cautioned as to the precancerous possibilities of the rectal polyps and a strict plan of follow-up observation should be emphasized.



Fig. 3. Large villous papilloma of distal rectum removed for biopsy by local excision. Serial sections, histologically benign.

Villous papillomas and carcinoid tumors are the next most frequent benign lesions involving the distal bowel. However, both lesions possess malignant possibilities which must be considered foremost. A villous papilloma is an insidious lesion; one-third of these are malignant at the time of the first discovery. The malignant papillomas are usually low grade, histologically, but frequently have been observed to reoccur many years later as highly malignant mucinous carcinomas with fatal prognoses. So these lesions must be treated initially as any other adenocarcinoma of the bowel[7] (Fig. 3).

The villous papilloma is a soft, shaggy tumor with rather ill-defined edges, attached by a broad base and extending usually over a wide area. This lesion is characterized by the copious mucus that it produces. Some patients may give a history of discharging literally cups of mucus each day.[8] This lesion is quite soft to palpation and is capable of secreting considerable mucus even with digital pressure. On proctosigmoidoscopic examination, it is usually polypoid in appearance, fre-

quently possessing villous like projections. Repeated biopsies may be reported as benign until finally a more firm area of the tumor may prove positive if malignant degeneration has occurred. Since multiple sections are frequently required to rule out malignancy, in these lesions, the only acceptable and safe method of approach is the total excision to produce the entire tumor for the pathological study.

Villous papillomas below the peritoneal reflection may frequently be excised with the fulgurating snare. If proctoscopic visualization and digital palpation indicate a firm lesion in part or its entirety, with some granular surface changes, the examiner should strongly suspect malignant changes and take deep biopsies from the most suspicious areas. Should these prove positive, then an abdominoperineal resection or a "pull-thru" procedure, depending upon the level of the lesion, is indicated.[2] Should these biopsies be reported as benign, then the entire lesion should be excised with the fulgurating snare for further study. If no malignant elements can be found, a snare excision may be considered as adequate treatment. However, recurrences are common and the patient should be so advised and followed accordingly.

When large villous papillomas occur above the peritoneal reflection, snare excision is a more hazardous procedure. The smaller lesions may be excised by this method. Larger lesions should be removed in their entirety and this is best accomplished by an anterior resection. We no longer feel that the multiple biopsy and fulguration technique is safe therapy, since isolated areas of malignancy may be missed. The pathologist must have the entire lesion.

Carcinoid tumors of the rectum have been largely overlooked until recently. The first case was reported in the literature in 1912; only five additional cases were added to the literature in the next thirty years, but the past decade has witnessed the recording of well over 100 cases of rectal carcinoid. All investigators are now in agreement that carcinoid tumors are malignant, although characteristically slow in growth and metastasis.[1,9,10] Even after the disease has spread to the lymph nodes and other parts, it may produce little or no effect upon the patient for a period of months or years. A little more than 10 per cent of rectal carcinoids have developed metastasis, a figure which exceeds that for similar growths of the appendix, but is only about one-fourth as great as that for carcinoids elsewhere in the gastrointestinal tract. The favorable position held in this regard by appendiceal and rectal cardinoids appears to rest mainly on circumstances leading to early surgical intervention.[11,12]

Small carcinoids of the distal colon within reach of the sigmoidoscope are subject to visual scrutiny, and may be suspected to be other than adenomatous polyps if they have the appearance of a submucosal nodule with normal mucosa overlying the excrescence. As these lesions increase in size, the mucosa is invaded to give a granular appearance; subsequently, the lesion may be ulcerated and stenosing—much the same as any scirrhous adenocarcinoma. Since it is our policy to biopsy all polypoid lesions greater than 2 mm. in diameter, whether they are mucosal or submucosal in origin, we feel that by so doing we will pick up the carcinoids with invasive tendencies. The treatment of small carcinoids is still somewhat controversial.[12] Our rule has been as follows: if the lesion is greater than 4 to 5 mm. in diameter and has a tendency toward invasion of the submucosa and muscularis, then we feel that a resection of the involved segment is indicated. Smaller noninvasive lesions can be safely treated by electrofulguration.

The subject of carcinoid tumor cannot be abandoned without mentioning the interesting evidence that secretions of these lesions produce increased blood levels of 5-hydroxytrytamine which in turn is thought responsible for the carcinoid syndrome. This syndrome which occurs only in carcinoid patients with metastases, consists of episodes of flushing that may last seven to eight minutes, plethoric facies, diarrhea and edema of the legs. Many of these patients will have sclerosis of the valves of the right heart; even so, the prognosis may not be necessarily bad and some of these patients have lived for a number of years.[13]

Adenocarcinoma is by far the most prevalent malignant lesion of the distal colon. The diagnosis is relatively simple, if one is alert to the cardinal symptoms of bowel cancer. Silent, asymptomatic, lesions do definitely occur, but the great majority (98 per cent, University of Michigan Series)[14] of patients with adenocarcinoma of the rectum and sigmoid colon will give a history of one or more of the following symptoms:

1. *Bleeding.*—This is usually bright red but may be dark and mixed in with the stool.

2. *Change of bowel habits.*—A careful history may not reveal any actual change of bowel habits until late in the course of the tumor's development. Early, many patients may have a sensation of urgency and pass more flatus than usual, accompanied by mucus. Often such a simple clue will lead an astute examiner to a diagnosis.

3. *Pain.*—Rectosigmoid lesions may compromise the bowel lumen early to give rise to crampy abdominal pains preceding defecation. This is more infrequent with rectal lesions; however, many of these patients may complain of low backache and tenesmus as the lesion approaches the sphincter.

A positive history of one or more of the above symptoms should be reason enough to institute the diagnostic triad to rule out bowel malignancy:

1. *Digital examination* will reveal that nearly 50 per cent of these lesions can be palpated by a 10 cm. examining finger.[3] At this point the examiner should also satisfy himself as to the degree of local extension and fixation; if the tumor is palpable, one can learn a great deal about its nature by simple palpation.

2. *Proctosigmoidoscopic examination* with a 25-cm. scope will demonstrate that over 75 per cent of the colonic carcinomas arise in the distal colon.[3] Lesions above the reach of the examining finger can be carefully palpated with the end of the scope to yield some information as to its fixation. Biopsies should be taken at this stage of the examination and they should be multiple and from various areas of the tumor. With a little experience, the occasional examiner will learn the characteristic appearances of adenocarcinomas, whether they be polypoid or ulcerative with rolled edges, and his impression by actual visualization is a very important clue in the establishment of the diagnosis. At this point the level of the lower margin of the cancer should be measured and recorded for consideration by the exploring surgeon in selecting the operative procedure of choice.

3. *Air contrast barium enema studies* should always be ordered unless the lesion is nearly obstructing in nature, particularly, to rule out second primary neoplasms and polyps elsewhere in the colon. It is estimated that one-third of the patients with rectal and colonic cancer will also have adenomatous polyps located elsewhere in the bowel.

Moynihan[15] made the significant and often quoted statement that, "Surgery of malignant disease is not a surgery of organs, it is the anatomy of the lymphatic system."[13] Nowhere is this more applicable than to the malignant lesions of the rectum and colon. Since the introduction of the classical abdominoperineal excision by Miles in 1908,[16] this operation has become established as the standard procedure for removing rectal cancer.

Miles described three directions of lymphatic spread of cancer of the rectum and distal sigmoid colon,[17] namely, the *upward* or *superior* avenue of metastases along the course of the superior hemorrhoidal vessels; a *lateral* avenue of spread eventually terminating in the iliac lymphatics; and the *downward* or *retrograde* avenue of spread below the level of the tumor.

For our own satisfaction we have verified these avenues of metastases with the *in vivo* injection of a vital dye (Direct Sky-Blue, used with hyaluronidase-Wyeth). Dye spreads laterally only if injected below the middle valve of Houston (7 to 8 cm. from the anal verge) and then along the course of the middle hemorrhoidal lymphatics in the lateral rectal stalks and not *via* the levator muscle as has been previously described as the site of lateral metastases.[17] Freidin[18] of Australia confirmed this observation and testified that low rectal lesions have a poorer prognosis than those located above the middle valve of Houston due to the opportunity for additional spread of cancer laterally. He was unable to demonstrate any lateral lymphatic metastases when the cancers were situated above the middle valve of Houston. The closer the lesions to the middle valve of Houston (in a caudal direction), the greater the instance of lateral lymphatic metastases. Freidin also showed that lateral metastases could occur without blockage of the superior chain of lymph nodes.

The chief route of metastasis in cancer situated at any level in the rectum is along the superior hemorrhoidal chain of lymphatics. Here, nodes may be involved at any level up to the origin of the inferior mesenteric vessels from the aorta and the vena cava. We are in complete agreement that the Miles (abdomino-perineal) resection is the best operation for cancers of the distal rectum, located below the middle valve of Houston, if the operator is diligent in performing a high ligation of the inferior mesenteric pedicle. We would like to add that the iliac areas should be inspected closely for involved lymph nodes which should be removed if

suspected to be involved with metastases (Fig. 4).

Cancers of the upper rectum (above the middle valve of Houston) do not spread laterally but may involve the superior lymphatics and spread retrograde for a distance of 8 to 10 cm. below the lesion. Retrograde metastasis is not common but may occur. Because of this possibility, we feel that any cancer located below the 12 cm. level should be resected by removing the entire rectum, this can be accomplished best by a "pull-thru" type of resection as recommended by Bacon.[3] Lesions between 7 to 12 cm. level are best suited for this procedure if local extension does not exist. If the surgeon is not experienced in the "pull-thru" procedure, he should then resect the entire rectum by a Miles (abdomino-perineal) resection. We feel that an anterior resection with anastomosis is not a good cancer operation for lesions below the 12 cm. level because of the high recurrence rate due to retrograde metastasis and seeding through manipulation of the lesion.

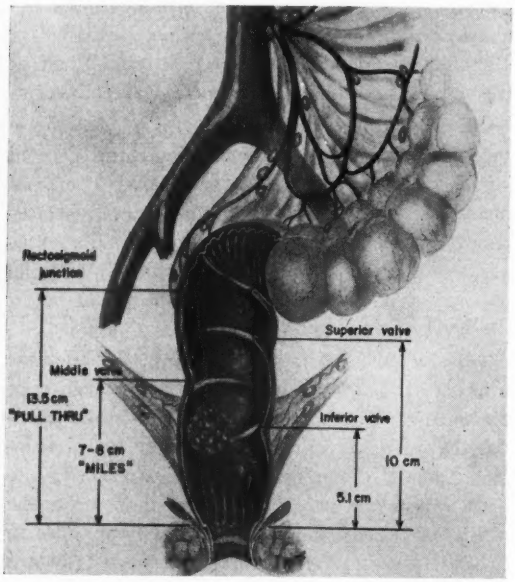


Fig. 4. Lymphatic drainage of rectum and sigmoid colon.

Cancers of the rectosigmoid and distal sigmoid colon above 12 cm. are usually amenable to anterior resection and anastomosis if the operator feels that the bowel can be sufficiently mobilized to get 8 to 10 cm. below the lesion with his bowel transection. We have learned never to promise any specific operation to a patient in advance, and particularly do we avoid promising that he will not awaken from surgery with a colostomy, because often fixation and local extension are much greater at the time of exploration than surmised on examination. However, a surgeon should promise the patient with a cancer of the distal colon that he will perform the best cancer operation that he can for the specific lesion encountered. The final decision can only be made with the abdomen open at the time of surgery.

Summary

1. The adenomatous polyp is the most frequently encountered premalignant lesion of the colon. Electrofulguration and snare excision are the common methods of treatment.

2. Villous papillomas may occur as benign lesions in two-thirds of the patients. Malignancy should always be carefully ruled out by total biopsy of the lesion.

3. Carcinoid tumors of the rectum are malignant and should be treated as adenocarcinomas except for the extremely small (2 to 3 mm.) lesions that can be safely destroyed with electrofulguration.

4. Adenocarcinoma is the most frequent malignant lesion of the colon. Adequate knowledge of the lymphatic drainage of the specific portion of bowel involved with cancer is the key to successful surgery.

References

1. Ariel, I. M.: Argentaffin (carcinoid) tumors of the small intestine; report of 11 cases and review of literature. Arch. Path., 27:25 (Jan.) 1939.
2. Bacon, H. E., Lowell, E. J., Trimpi, H. D.: Villous papillomas. Surgery, 35:77, 1954.
3. Bacon, H. E., and Sherman, L. F.: Cancer of the colon and rectum. J. M. A. Alabama, 19:310 (April) 1950.
4. Sullivan, W. Albert, and Lunseth, John B.: Early detection of cancer. Journal-Lancet, 77:408 (Nov.) 1957.
5. Christenson, H. W., and Tenner, R. J.: The significance, incidence and treatment of adenomas in the rectum and rectosigmoid. Bull. Univ. Minn. Hosp., 21:75 (Nov. 4) 1949.
6. Enquist, I. F.: The incidence and significance of polyps of the colon and rectum. Surgery, 42:681 (Oct.) 1957.
7. Tenner, R. J.: Villous papilloma. Unpublished Thesis—Minn. Acad. Med. (April) 1957.
8. Gabriel, W. B.: Surgical management of large villous tumors of the rectum. Proc. Roy. Soc. Med., 45:696, 1952.
9. Pearson, C. M., and Fitzgerald, P. J.: Carcinoid tumors—re-emphasis of their malignant nature; review of 140 cases. Cancer, 2:1005 (Nov.) 1949.
10. Ritchie, G., and Stafford, W. E.: Argentaffin; tumors of the gastrointestinal tract. Arch. Path., 38:123 (Sept.) 1944.

(Additional references on Page 1108)

Massive Small Bowel Resection

Presented as an Inaugural Thesis before the Minneapolis Academy of Medicine, March 17, 1958.

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SINCE the first successful extensive small bowel resection in 1881 by Koeberle, it has become increasingly more common for surgeons to encounter conditions in which extensive small bowel resection is necessary. It has been stated that a loss of one-third of the intestine was possible with the maintenance of normal weight and strength. Loss of one-third to three-fourths of the small intestine has usually led to a loss of weight and strength and frequent diarrhea. The loss of more than three-fourths of the small intestine has often led to severe merasmus and death of the patient. At the time of Koeberle's first case report, 205 cm. of the bowel was removed. The statistics and case reports in the literature have been somewhat difficult to interpret since there have been various methods of reporting with a note made of the amount of bowel resected on some occasions—on others, the amount of bowel remaining—these figures being either in centimeters or in percentages of the total small bowel. This has led to some confusion in the interpretation of the various reports.

Haymond[1] in reviewing 1161 cases in which the total length was noted at operation or autopsy, arrived at an average length of the small bowel of 21 ft. 6 in. or approximately 650 cm. This has been considered as a relative standard of measurement. As a result, 200 cm. (approximately one-third) of the bowel has been thought to be the starting point for the consideration of massive small bowel resection. This figure, of course, is subject to wide variations depending on the amount of bowel present in the patient. Two hundred cm. would be a relatively small excision in the negro patient reported by Lamb with a total length of small bowel of 1260 cm. or 40 ft.

The statistics have further been confused by the reporting of the successful cases and the absence of reporting of the unsuccessful cases. In Haymond's review of 257 cases of massive resection, the total mortality was 33.5 per cent. From his review, it was determined that a patient could return to normal after a 35 per cent resection of the small bowel. It was thought that a 50 per cent resection was the upper limit of safety. From various reports in the literature it has been well documented that many excisions above 50 per cent have been compatible with a relatively normal existence in several patients.

Etiology

Occasionally in the elective surgical treatment of disease, such as regional enteritis or malignancy, it has become necessary to excise large segments of the small bowel either at one stage or in multiple stage procedures. Usually, however, the massive resection of the small intestine has been performed under uncontrolled conditions and as an emergency procedure. This has often been necessitated in resections where extensive neoplastic disease or when necrotic infarcted gut, due to mesenteric vascular occlusion, has been encountered.

Mesenteric arterial embolism or thrombosis are more common causes of the vascular occlusion than venous thrombosis. The arterial embolism usually follows coronary heart disease or auricular fibrillation. Thrombosis is often the end result of abdominal infections, mechanical obstructions, or severe trauma. The policy of earlier surgical intervention in the cases of mechanical small bowel obstruction has lowered the incidence of mesenteric vascular occlusion as an end result of these obstructions. In Haymond's review in 1935, a large number of cases requiring massive resection of the small bowel appeared in patients with volvulus and with incarcerated or strangulating hernia. Pathologic conditions of the female pelvis (including uterine perforations with a currette) also accounted for a distinguished number of cases in this earlier review. Undoubtedly the improvement in surgical and gynecological technique has lessened this hazard.

Symptomatology of Vascular Occlusion

The early findings in the cases of mesenteric vas-

cular occlusion are often not dramatic. However, in some there is a sudden onset of fairly severe symptoms of upper abdominal pain associated with nausea and vomiting. There may or may not be associated diarrhea early in the course. Occasionally the onset is gradual and insidious and the development of a slightly tender abdomen with minimal rigidity and later distention may occur without the suspicion of the underlying vascular occlusive process coming into mind.[2] Clinically the picture may be acute, severe, and dramatic—as in pancreatitis or perforated viscus—or it may be mild and run a course of several days. The diagnosis should perhaps be suspected in cases with relatively severe abdominal symptoms and minimal physical findings. The diagnosis is rarely made preoperatively which is of some consolation when one opens the abdomen and finds the occluded vessels and necrotic bowel. However, early surgical intervention is mandatory and has resulted in an improvement in the mortality in statistics. For example, in 1938 at the Mayo Clinic, the mortality was 84 per cent in a review of cases to that time, with only 31 per cent being operated upon. From 1938 to 1948 with 54 per cent undergoing surgery, the mortality rate was down to 23 per cent.[3]

What Happens After Massive Resection of the Small Intestine?—The changes in water absorption and the metabolism of various food substances have led to many experimental and clinical studies. Balance studies and absorption studies for carbohydrates, proteins and fats have revealed some interesting if not entirely conclusive results.

Adaptation.—That there is an adaptation of the body to the new digestive program is, of course, obvious. Part of this adaptation of the body takes place by a change in the total weight of the patient. The loss of weight leads to a lower basal metabolic rate and a lower caloric requirement and thus a diminished need for protein replacement. At a certain minimum weight, if the resection has not been too drastic, the decreased nutritional needs are eventually met by the expanding capacity of the intestinal absorption and the weight finally stabilizes. There is also adaptation by the intestine increasing its absorptive capacity. This adaptation occurs in both a functional and an anatomic manner. Within a few weeks there is a slower emptying of the stomach as shown by Stasoff and an increased gastric secretion. The colon has been shown to have an increased capacity to absorb water, electrolytes and amino acids. Unfortunately there is an apparent failure of the colon to absorb fats.

There is considerable anatomic adaptation of the small bowel after massive resection. There is an increase in the size of the lumen and a thickening of the wall of the bowel. This is noticeable on x-ray examinations with a coarsening of the mucosal pattern being present. Microscopic studies in dogs by Monari have shown that the mucous membrane doubles its normal thickness and the villi become larger and more numerous after massive resections. Flint[4] stated there was a 400 per cent increase in the absorptive area of the small bowel by this marked hypertrophy which occurs primarily in the tunica mucosa. Common findings after the massive resection of the intestine have been loss of weight, diarrhea, edema, anemia, loss of fat and protein, lowering of blood calcium and serum protein and elongation, dilatation, and hypertrophy of the remaining bowel.

In considering the changes in water absorption which occur after massive resection, it is remarkable that many times the diarrhea and frequent watery stools have returned to relatively normal within six weeks postoperatively. The colon in some cases develops a remarkable reservoir effect. In one case reported by Jackson and Linder[5] (in which only 6 to 7 inches of proximal jejunum and distal ileum remained between the ligament of Treitz and the cecum), the patient living for three and one half years, had a disappearance of his postoperative diarrhea and returned to one evacuation a day which "would not disgrace an elephant, being up to one-and-one-half gallons." On unrestricted water intakes, it has been found that 90 per cent or more of the feces consists of water. There appears to be little objective correlation of the fluid intake to the frequency of bowel movements or their water content. Subjectively the matter of urgency and tenesmus appears to be better controlled with restriction of oral fluids.

Animal experiments have shown that approximately 50 to 70 per cent of the small intestine could be removed without ill effect. Weight was maintained and protein and fat absorption was not significantly altered. On the removal of the distal 50 per cent of the small bowel, there was profound interference of fat absorption and considerable loss of weight. It has also been determined that the ileocecal valve is of considerable importance

in the sacrifice of segments of bowel, this being particularly true when the distal bowel was sacrificed but of lesser importance with sacrifice of the proximal bowel. Pietz,[6] in his excellent review, has remarked that patients can get along with only one or two feet of small bowel remaining. When there are six feet of small bowel left there is usually normal metabolism and no significant fat losses. Fat, nitrogen, and electrolytic excretions in the stool are less extensive if a segment of ileum, with or without jejunum, the ileocecal valve, and the entire colon is present as compared to a similar length of jejunum alone with a portion of colon being absent.

Carbohydrates.—There is a rapid adaptation for the absorption of carbohydrate. The colon, of course, can absorb fairly large amounts of glucose. The small intestine has been shown to be much more important as a medium of absorption than of digestion. In the study of carbohydrate metabolism in these patients, balance studies have been of little value. Fermentation by bacteria in the colon has made the quantitative studies of the stool sugars and starches very inaccurate in the determination of carbohydrate metabolism. It has been stated that the various food elements should be studied by at least two tests if the absorption method is used.

In following carbohydrate metabolism the absorption tests most often utilized are the oral glucose tolerance test, the oral galactose tolerance test, and the intravenous glucose tolerance test. In following patients with tests to determine the limits of absorption it should be remembered that these are very vigorous and place a full load on the remaining gut at the time of the test. Balance studies are somewhat more realistic. The full capacity of the gut is not necessarily belabored by the balance studies. The absorption studies which are done within a certain time are also less realistic since in balance studies time for absorption is not important and thus more closely resemble the normal condition of the bowel during the twenty-four-hour period. The absorption studies, in other words, make the gut work overtime. The ease of carrying out the absorption studies and lessened activity for overworked laboratory facilities make them very desirable. When the oral carbohydrate tolerance tests have been utilized it is shown that there is very little abnormality in the patients with remaining short intestines.

Proteins.—Protein metabolism in these patients often reaches a relative state of equilibrium. In several cases of massive resection which have been followed, normal serum proteins have been found. However, it appears that a small amount of jejunum is necessary for the absorption of proteins. In Schwartz'[7] case of duodenal mid transverse colostomy, there was an inability of the patient to absorb oral nitrogen and as you will note in one of the cases presented here with only 5 cm. of jejunum remaining, hypoproteinemia was a real problem. The laboratory absorptive tests used in following protein metabolism have been the oral methionine tolerance and glycine tolerance. In a patient with only 90 cm. of jejunum, there was nearly a normal tolerance of both of these tests. In another patient with only 6 to 7 in. of proximal jejunum and distal ileum remaining, the serum proteins were normal until just before death. In using the oral methionine tolerance test in a patient with 13 cm. of jejunum, Althausen[8] showed a 40 per cent tolerance as compared to the control. It has been shown that the colon can adapt itself to absorb fairly large amounts of amino acids. This has been demonstrated by injecting amigen into the colon and measuring the amount of absorption. In animal experiments Kremen and his associates[9] have shown that a high fecal nitrogen loss obtains when the ileum is removed and this is increased when the animal is on a high fat diet with more fat being lost in the stool. Fecal nitrogen excretion has been shown to vary with the volume of the stool and not the volume of the nitrogen intake.

Fats.—The metabolism of fats in patients with massive small bowel resections is an entirely different problem. This is the area in which these patients fail most miserably. Again borrowing from the experience in animal experimentation, it is accepted that the ileum is the primary fat absorption area in dogs. In patients with massive bowel resections steatorrhea has been the major problem. Schwartz has demonstrated that on 100 gm. fat intake the normal individual absorbs approximately 95 gm. and a case of massive small bowel resection absorbs 55 gm. In reviewing several cases with quantitative studies of fat absorption varying figures from 30 to 75 per cent of normal fat absorption is possible. In most of these patients there is an enormous loss of fat in the stool, up to five times normal. There are two types of steatorrhea described by Fowwther: one the defi-

cient fat absorption type in which the split fat is elevated in the stool; the other being the deficient fat digestive type in which the neutral fat is elevated in the stool. In cases with massive intestinal resection, fat remains in the stool owing to poor fat absorption. The increased fecal fat in these patients is not related to stool volume but to fat intake as contrasted with the excretion of fecal nitrogen. That there is some adaptation of the remaining bowel to increase its fat absorptive capacities has been shown by Schwartz in a patient with 90 cm. of jejunum remaining and a jejuno transverse colostomy. In the first month postoperatively there was absorption of 40 per cent of the fat and six months postoperatively there was absorption of 65 per cent of the fat on balanced studies.

In following fat metabolism in these patients, absorption studies as well as balance studies have been utilized. One of the absorption studies is the oral vitamin A tolerance test. In this test, the vitamin A content of the plasma is measured four hours after the oral ingestion of 7,000 International Units of vitamin A per kilogram body weight. A patient of Althausen's,[10] with 15 cm. of jejunum remaining and a jejuno-transverse colostomy showed 8 per cent of the average normal increase in four hours was possible. In another with 90 cm. of small bowel remaining, there was little change in the oral vitamin A tolerance measured at six weeks and twenty months. Another fat absorption test which has been utilized is the so called "butter-tolerance test." In this test, 60 gm. of butter is ingested followed by turbidometric determinations of serum for six hours. By means of this test it appears that there is an increase in the fat absorptive adaptation of the bowel. A patient with 120 cm. of small bowel remaining had 9 per cent of normal absorption in one month and 100 per cent absorption at six months. Another with 90 per cent of bowel remaining had 74 per cent of normal absorption at twenty months.

Unfortunately the altering of the type of diet has not been of much benefit in changing the characteristics of fat absorption. Changing the diet from natural foods to a synthetic type of predigested foods had little effect on the utilization of fats. The addition of papain (which reduces the fecal fat in pancreatic insufficiency) has not been highly beneficial in managing these cases. Neither has the addition of "Tween 80" to the diet.[11] An interesting case was cited by Bothe[12] surviving four years following resection of all but 15 cm. of proximal jejunum and 6 cm. of distal ileum.

This patient was losing fat at a rate three to five times normal in the stool daily but maintained his weight and well-being on a high fat diet consisting of at least two quarts of milk a day, a quarter pound of cheese and a considerable amount of butter.

Calcium.—An associated deficiency these patients often demonstrate is hypocalcemia. This problem is related to the large amount of fat in the stool carrying out with it a large quantity of calcium in the form of calcium soaps. The impairment of calcium absorption is unlikely if 6 feet of small bowel remains. It has been demonstrated that hypocalcemia is a more common occurrence if only jejunum remains. This may be related to the fact that the ileocecal valve is removed if ileum is sacrificed. Tetany has occasionally been a problem in massive bowel resection. The body's stores of electrolytes and calcium are drawn upon.

Electrolytes.—It is true that normal electrolyte balance may not have been a problem in most massive resections. Hypopotassemia was a problem, however, in one of Trafford's cases in which there was an estimated 92 per cent resection, this being one of the most extensive cases reported.[13] It will be noted that hypopotassemia was a problem in the extensive resection reported here.

Vitamins.—The absorption of vitamins is to be noted in managing these patients. The fat-soluble vitamins are lost in great amounts. These patients have a low ascorbic acid level. It is of importance that additional vitamins, ofttimes parenterally administered, be added to their regimen.

Other Changes.—There are other physiologic and psychologic effects which occasionally are encountered in the management of patients of this type. The removal of a large segment of bowel from the body naturally removes a large portion of the vascular bed from the body. In Brezen's case, the blood volume dropped one-third after resecting all but 18 in. of the small bowel, 10 in. of jejunum and 8 in. of ileum.[14] Most of these patients have been shown to have a considerable decrease in their libido following massive intestinal resection. Often they have a change in their normal psyche. This is not unusual when a person

has to alter his entire mode of living to accommodate to his changing absorptive processes and bowel evacuation.

The presence of anemia after massive resection has been challenged by Jackson and Linder. It is their thought that massive resection in itself is probably not the cause of the anemia. They believe that anemia, hypoproteinemia and edema, depression of calcium, and tetany are extremely rare after massive resections and are probably associated with the presence of other conditions. They believe that the "jejuno-ileal insufficiency" of Bennet and Hardwick which leads to a sprue-like syndrome with steatorrhea anemia, edema, tetany and the like, is not the same as the "under-nutrition syndrome" of massive resection. The "under-nutrition syndrome" is characterized by loss of weight, fall in basal metabolic rate, loss of libido, abnormal desire for salt, and maintenance of electrolytic balance by depleting the body stores. It has been advanced that the causative factors of the anemia and the related findings are usually associated with other conditions present with massive excision such as infiltration of the gut with tuberculosis or malignant processes, regional enteritis, gastrocolic fistula, multiple strictures or the "loop syndrome." The "loop syndrome" is described as a natural or surgical production of pockets, pouches, loops or bypasses in the small bowel. This is demonstrated in one of the reported cases with a side-to-side intestinal anastamosis following resection. The features of intestinal insufficiency do occur with remarkable rapidity following this reconstruction suggesting a "toxic" agent as the result of these "loops."

Management.—In the management of these patients, it is, of course, important that the patient be given a diet high in protein and high in caloric value. Frequency of feeding is of benefit. A low fat diet is recommended. Supplemental electrolytes may be important and supplemental vitamins are required. The addition of food supplements and therapeutic adjuvants such as "Tween 80," pancreatin, bentyl, cortisone, and papain, may all have their place. There are no lasting benefits from vagotomy in animal experimentation.[15]

Case Reports

Case 1.—Mrs. V. D., aged forty-four, was admitted to Swedish Hospital (Minneapolis) on February 15, 1957, with the complaint of melena for one-and-one-half days' duration. History revealed that in 1939 the patient had undergone a dilitation and curretage with perforation of the uterus and the onset of mesenteric thrombosis necessitating immediate resection of small bowel with exception of "three feet" of the small intestine. Subsequent to that time, the patient had had recurrent gastrointestinal bleeding evidenced by melena on several occasions occurring every one or two years with no warning signs. In 1949, the patient had gastrointestinal bleeding with hematemsis and a diagnosis of duodenal ulcer had been made by means of x-ray at that time. In 1955, the patient had marked melena and the hemoglobin had dropped to 5.1 gm. The patient had continued to have marked diarrhea with six to eight stools daily since the time of the intestinal resection.

Physical examination revealed no gross abnormalities. The patient weighed 100 to 105 pounds and had a best weight of 110 pounds during one of her pregnancies. The laboratory findings revealed a hemoglobin of 7.9 gm. and a hematocrit of 22 volumes per cent.

The patient underwent surgery on February 19, 1957, at which time there was no evidence of ulceration in the region of the duodenum. Gastrotomy was done and normal findings were encountered. The small bowel measured 41½ in. from the ligament of Treitz to the ileocecal valve. Side-to-side anastamosis which had previously been done in 1939 was encountered "18" inches from the ileocecal valve with large blind pockets, being present. The area involved was resected (4 in.) and an end-to-end anastomasis of the small bowel was done.

The patient had an uneventful convalescence and at six weeks was having one to two stools per day. Thirteen months postoperatively, the patient was again seen and at this time her weight was 115 pounds and she was having one to two stools daily; no diarrhea and no melena had been present since surgery. She had no food dyscrasias and stated that she felt excellent.

Case 2.—Mrs. A. S., aged sixty-five, was admitted to the New Prague Community Hospital on October 30, 1955. At this time she gave a history of having had abdominal pain and distention of one months' duration which had become more severe the night before admission. The patient had had a dilatation and curretage and conization of the cervix for an erosion two months prior to this time and at this time the abdomen revealed negative findings.

Physical examination at this time revealed the presence of abdominal distention and a mass in the mid-abdomen. Blood pressure was 138/90, pulse 84, temperature 99 and the patient gave evidence of recent weight loss. Laboratory findings revealed a white blood count of 40,350, PMN's 90 per cent and hemoglobin 14.7 gm. Other findings were within normal limits. X-ray examination of the abdomen revealed dilated small bowel loops.

The patient was treated by the introduction of nasogastric suction, intravenous fluids and antibiotics and on October 31, 1955, at which time her condition was worsening, her distention increasing even with suction, and the bowel sounds becoming inactive, it was thought wise to give the patient the benefit of abdominal exploration.

Surgery was done and at the time of laparotomy a superior mesenteric thrombosis was encountered with an infarction of the bowel necessitating resection of the entire small bowel from 1½ in. distal to the ligament of Treitz to 4 in. above the ileocecal valve on the ascending colon. An end-to-end jejuno-colic anastamosis was done. A cystadenocarcinoma of the right ovary measuring 20 cm. in diameter was also excised. On later examination, it showed no evidence of a break-through of its capsule on examination. The operating time was one hour and fifteen minutes which is only mentioned to indicate the poor condition of the patient at the time of resection.

Bowel sounds were active on the second postoperative day. The suction was removed on the fifth postoperative day, but was re-inserted two days later because of the development of an intestinal fistula in the abdominal wound. This healed spontaneously in two weeks and remained healed. The patient was maintained on a high carbohydrate, high protein, low fat diet. The weight dropped to 80 pounds from a preoperative weight of 100 to 105 pounds. The patient continued to have two to four stools daily being maintained on two to three oz. of paregoric daily. She developed a severe edema of her legs and marked anemia. On forced feeding, supplemental intravenous administration, serum albumin the patient achieved a maximum weight postoperatively of 89½ pounds, four months following surgery. The patient gradually became worse and expired eight months postoperatively.

Of some interest is the laboratory data which revealed on the eighth postoperative day hemoglobin was 12.1 gm., serum chloride 99.1 mEq. per liter, serum sodium 148 mEq. per liter, serum potassium 4.5 mEq. per liter.

Four months postoperatively, hemoglobin was 12.5 gm., serum proteins 6.6 mg. per cent with a reversal of the globulin and albumin ratio, the globulin 4.8 mg. per cent and albumin 1.8 mg. per cent, serum calcium 4.7 mg. per cent, potassium 3 mEq. per liter and the blood volume studies were hematocrit 29 volume per cent, plasma volume 2.2 liters with total volume 3.1 liters (normal 2.4 to 3.5 liters). Liver function studies and bone marrow examination four months postoperatively were within normal limits.

References

1. Haymond, H. E.: Massive resection of the small intestine. Surg. Gynec. & Obst., 61:693, 1935.
2. Eckstan, A. E., and Barry, G. R.: Mesenteric vascular occlusion. Wisconsin M. J., 53:548, 1954.
3. Seybold, W. D., and Musgrove, J. E.: Surgical aspects of mesenteric vascular occlusion. Proc. Staff Meet. Mayo Clin., 25:585, 1950.
4. Flint, J. M.: Massive intestinal resection. Bull. Johns Hopkins Hosp., 23:127, 1912.
5. Jackson, W. P. U., and Linder, G. C.: The clinical and metabolic effects of massive intestinal resection. Acta med. scandinav., Supplement No. 306, 1955.
6. Pietz, D. G.: Nutritional and electrolyte evaluation. Gastroenterology, 31:56, 1956.
7. Schwartz, M. K., et al: Fat and nitrogen metabolism. S. Forum., 6:385, 1955.
8. Althausen, T. L., et al: Digestion and absorption after massive resection of small intestine. I. Gastroenterology, 12:795, 1949.
9. Kremen, A. J., et al: An experimental evaluation of the nutritional importance of the proximal and distal small intestine. Ann. Surg., 140:439, 1954.
10. Althausen, T. L., et al: Digestion and absorption after massive resection of small intestine. II. Gastroenterology, 16:126, 1950.
11. Weckesser, E. C., et al: Extensive resection of the small intestine. Am. J. Surg., 78:706, 1949.
12. Bothe, F. A., et al: A massive resection of small intestine. Ann. Surg., 140:755, 1954.
13. Trafford, H. S.: The outlook after massive resection of the small intestine. Brit. J. Surg., 44:10, 1956.
14. Brezin, D., and Oren, B. G.: Survival following massive resection of the small and large bowel. Gastroenterology, 26:895, 1954.
15. Richardson, R. D.: Massive resection of the small intestine. A.M.A. Arch. Surg., 73:981, 1956.

Discussion

DR. ARNOLD J. KREMEN: I have enjoyed very much Dr. Lundquist's remarks on the problem of "Massive Small Bowel Resections." This is a controversial area and quite appropriately should be a topic for discussion at meetings of groups such as this.

Several years ago, I published a paper ("An Experimental Evaluation of the Nutritional Importance of the Proximal and Distal Small Intestine," Annals of Surgery: September, 1954), reporting an experience in dogs wherein we attempted to define the extent of resection that could be tolerated and to evaluate which areas of the small bowel are most vital to maintaining a normal nutritional state. From these studies, it was concluded that the proximal small bowel could be sacrificed without great nutritional derangement providing 30 per cent of distal small bowel and the ileocecal valve were present. The greatest weight loss and fecal fat loss occurred when the ileocecal valve was by-passed and the distal ileum was lost. With these observations in mind, it has been my experience that most clinical cases surviving massive intestinal resection in a good nutritional state have been those where it was possible to preserve, in the intestinal stream, the very terminal ileum and the ileocecal valve.

DR. N. K. JENSEN: First, I want to say that I have enjoyed Dr. Lundquist's paper very much. He has made an exhaustive search of the literature and has added some interesting material from his own experience. Dr. Donald S. Amatuzio, working at the Jay Phillips Laboratory, on a project that was first started under the auspices of the Cardiac Research Committee of Minneapolis, investigating lipids and relationship to arteriosclerosis, has recently shown that short-chain fatty acids are handled by the bowel much the same as glucose is, and that people with disturbance in fat digestion can handle the short-chain fatty acids very readily. We have recently studied a case with Doctor Amatuzio, a man who had the greater portion of his small intestine, the ascending, transverse and descending colon, resected, leaving him with a little over 7 feet of small intestine anastomosed directly to the sigmoid. This man gained weight, and lost most of his gastrointestinal symptoms on a diet which used coconut oil as a source of fats, coconut oil being made up of short-chain fatty acids. Doctor Amatuzio has also had success in handling celiac disease and other steatorrheas, replacing the long-chain fatty acids in the usual diet with fatty acids of 8 carbon lengths and less.

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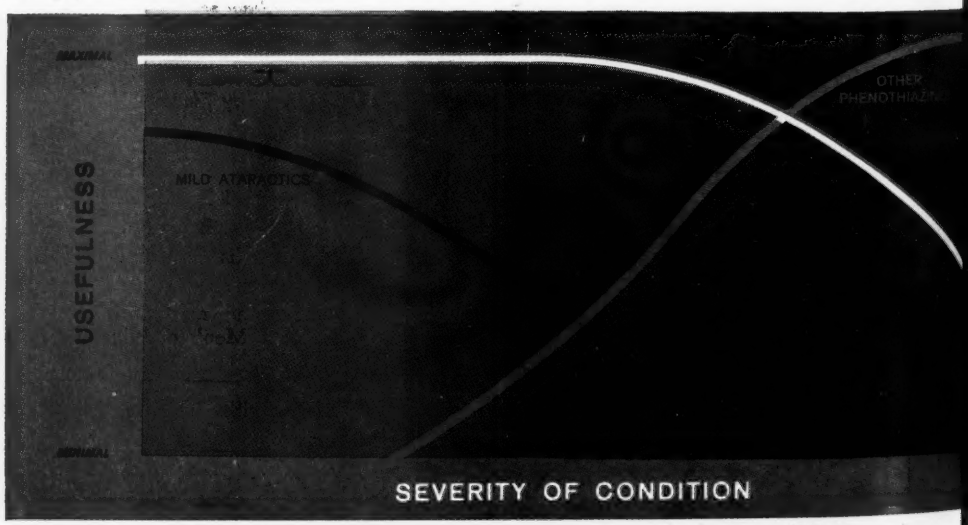
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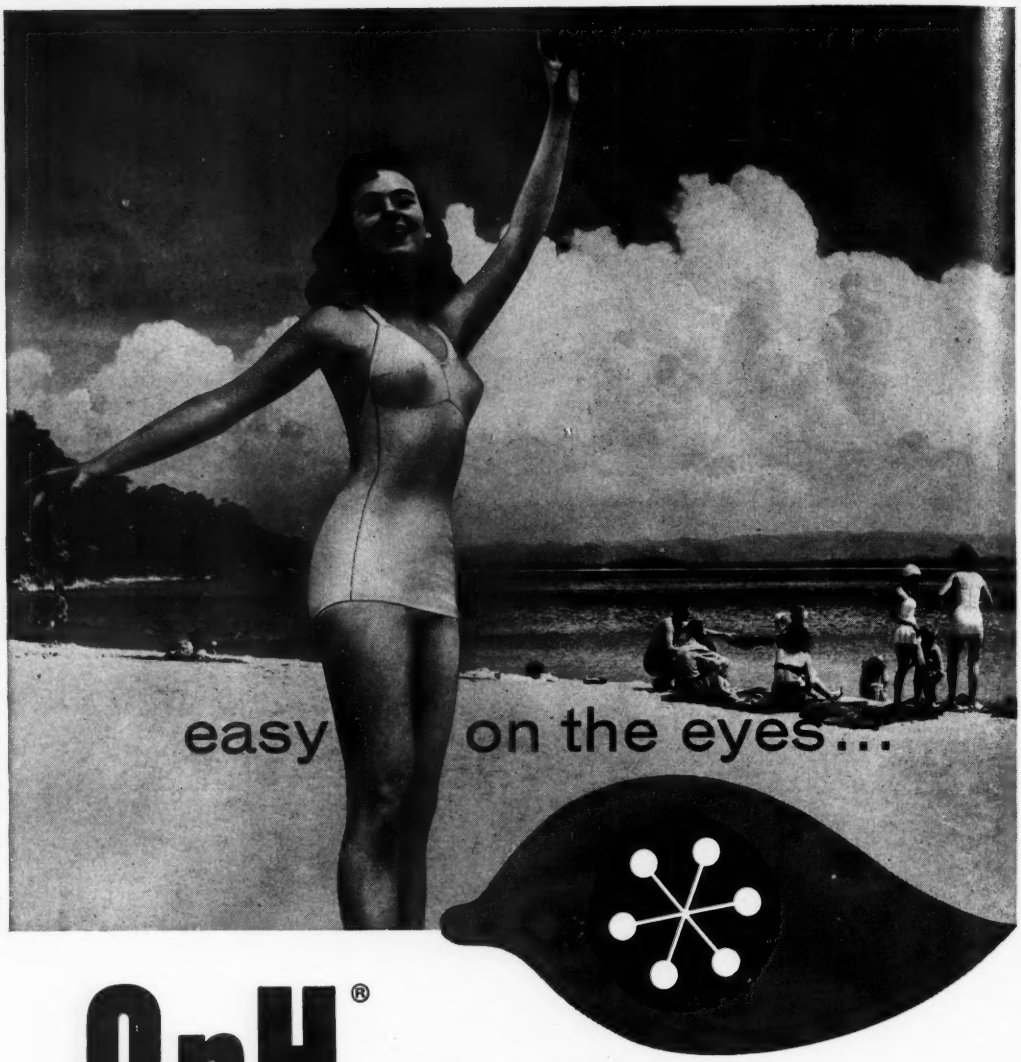
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The "Detached Syndrome" in the Aged

Some Aspects in Management

The "Detached Syndrome" in the aged begets serious problems. Prompt recognition and effective alleviation of this syndrome will help many to grow old gracefully.

ANTHONY R. TORTORA, M.D.
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LIFE is a continuous process with the result that aging becomes an inevitable process leading to physiologic, chemical, anatomic and psychologic changes. Physically, it manifests itself by a steady and progressive decline in all functions.

By definition, anatomy is the science of the structure of the body. Physiology is the function of the body. All function is physiology. The function of the brain is physiology; and since all mental function relies on cerebral function, the brain is the organ of the mind and all psychology is cerebral physiology. We must cope with progressive senescent changes which manifests themselves at different age levels and in separate organ systems. These changes include gradual impairment of "homeostasis"; cellular atrophy and degeneration of the nervous system; and disturbances in cell growth and tissue reparation. As the general

cortical function diminishes because of fatty and pigmentary degeneration of nerve cells, perception is decreased. To this impairment is usually added deafness and diminished acuity of vision, as well as lack of interest in intellectual matters. As the intellectual interest wanes, the instinctive interests become relatively prominent. Men imagine themselves strong in instincts and women concern themselves mostly with marriage and childbirth. With a decreased perceptual acuity, they spend their hours in reminiscence with the result that they revert to early experiences and try desperately to maintain the standard of their youth.[1]

The following statistics published by the National Conference of Aging in Washington should make us take notice of the clinical portent of our population. There are 12,000,000 persons, or more, past the age of sixty-five in the United States. Since 1900, the United States population has doubled and the number of persons past sixty-five has increased fourfold. By 1960, this group will number almost 15,000,000 and by 1970, almost 20,000,000. Obviously, we are confronted with problems by a large and increasing aged population and the need for gerontologic awareness becomes ever more cogent.

While the aged are subject to paranoid psychoses, depression and states of agitation, they are also subject to typical senile syndromes which are difficult to categorize except possibly to explain them as an aftermath of normal senile changes. Therefore, this presentation will deal with reactions to normal senility. An effort will be made to bring to the fore these behavioral patterns which suggest the insidious onset of senescence, so that we may be better equipped to understand these people and be in the vanguard for promoting social and economic means whereby they would be able to receive adequate emotional gratification and assistance through various resources at our command.

The psychologic disorders of the aged are usually those due to the removal (because of the inevitable senescent changes) of the influences of training, education and experience on primary personality patterns. Second, we see the emotional reactions which are basically a "detached syndrome"—a reaction to the loss of a loved one, friends, job, business or professional pursuits or power and influence, or loss of home or money and so forth. Third, there are the psychoses resulting from senescence and arteriosclerotic degenerative brain lesions and those secondary to somatic disorders. The latter is out of the province of this paper. It must be added, however, that psychotic episodes lasting hours or days may occur during cardiac decompensation, cerebral vascular insufficiency, dehydration and postoperative procedures. To all intents and purposes these are delirious reactions and are usually soon reversible.

The cardinal symptoms of senility are the psychic reactions to the "detached syndrome" and misoneism which is a dislike of and distaste for anything new.

The ease with which a senile person accepts dependency gives rise to psychologic regression—the concept of second childhood. The aged forget where they are, do not know how to operate modern equipment and continuously ask questions which have been answered numerous times. What appears to be a change in personality, is in reality an unmasking of the basic personality. As one ages, one finds it of effort to abide with social conduct and one also cares less. There is a tendency to feel that one has a good record and that one's reputation and character are established. The aged feel that the young should respect them even though they may have done nothing to earn respect except to keep on living. They become short-tempered and irascible. They often shed so much of their esthetic training that they revert to coarseness in conversation and thought.[1] Many are irritable, querulous, lacking in stamina and liable to depression. Impairment in health is aggravated by loneliness and a feeling of being unneeded and unloved.

Nothing appears to bring more pleasure to the aged than the success of achievements and happiness of their children. Quite often these accomplishments are cited as evidence of good stock. Other sources of gratification are respect of their associates in work, business and profession and the memories of past accomplishments. However, modern socio-economic factors tend to hamper such satisfactions. People nowadays marry early in life and have children generally before the age of thirty. Therefore, by the time the parents attain the age of fifty, the children are living on their own and are no longer under the parental influences. The need for the aged in the home, the need for their contribution to the maintenance of the home from a physical aspect is becoming of less significance. The age of mechanization and

automation of home appliances has excised from the older persons the satisfaction of contributing something physical to the home when they live with their children. The independence of today's young married couples seems to thwart any attempt of the aged to share the joys of their children. The counsel and advice of the older people may be construed as meddling. At times they are not trusted to baby-sit for fear of inattentiveness and falling asleep "on the job." Companions and friends die or move away and they find it difficult to mold themselves to these changes.[2] The aged are looked upon as economically inadequate while the young have a prospective and ever-increasing economic value. There is a loss of prestige due to decrease in physical vigor, mental faculties and acumen. Outsiders usurp influence once exercised and resentment follows. Therefore, the separation from children, friends, position, influence and power may result in psychic manifestations which I designate as the "detached syndrome."

The management of psychologic disorders of the aged requires diplomacy, skill and insight into human behavior. It must be a community project in which the family, social service worker and the family physician must contribute to the maintenance and preservation of the mental and physical well-being of the aged. A fair percentage of these people who are not employed are not voluntarily idle. Technologic changes, automation and compulsory retirement contribute to their idleness. Hence, consideration should be given to establishing policies and facilities to enable older people to find work commensurate with their physical and psychologic fitness.

From a psychological aspect, we may start with certain basic assumptions. Unless there is definite evidence of central nervous system disease, it is unlikely that any serious impairment in intellectual or sensory motor function will ensue. This denotes that, in all probability, the psychologic equipment is intact and capable of functioning. Because his physical limitations are not evident to others, he is likely to become more intent and vocal about informing others of their existence. He will become self-centered and more inclined to limit himself beyond necessary requirements of physical safety than would be true with an apparent limitation. If there are certain non-deforming diseases, the aged will ordinarily start with normal psychologic demands and with common reactions to stress and strain. But unless certain measures are taken, his mode of behavior will ultimately involve such infantile retrograde behavior as he is led to believe will assure him of ego-protection. While this does not exhaust the possibilities of the reactions to "old age," it does blanket the more common forms of behavior. The degree and severity of the behavior relies largely upon the amount of motivation the aged possesses towards returning to a place in the everyday world or his desire to excise himself from the situation that he feels may be taxing him beyond endurance.

There are certain psychologic approaches which the physician can make towards preventive mental hygiene which should be initiated promptly. In this way, we can hope to ward off the development of more serious mental reactions which may tend to leave lasting marks upon the behavior. It is important that we provide the aged patient with an opportunity to ventilate his frustrations, fears and concerns. If these vexations are not neutralized, devious routes to comfort his ego may take place. By airing their anxieties, harmful viewpoints are noted, exposed and possibly removed before they become deeply ingrained. The patient should be given emotional re-assurance and intelligent information about his age and its effect upon his life. He should be made to understand that his useful life has not ended, and that to grow old gracefully is an art. The patient should be helped towards a positive viewpoint so that the vast amount of thinking time at his disposal can be channeled into useful, constructive thoughts and deeds, rather than those that contribute to a feeling of inadequacy. He needs to do something, be active and to create. Of course the degree of activity may be curtailed because of infirmities, but even several minutes in useful endeavor several times a day will assist markedly in maintaining morale and serve to assure him of his ability to perform. Not only does this have a beneficial psychologic impact, but it also serves the patient and his physician with information regarding work tolerance and the establishment of a threshold work tolerance.[3]

Each individual was an infant. Each infant is an individual with his own rate and potential for physiologic, intellectual and emotional growth and development. Each is influenced by his environment to which he reacts according to his own capacities. Above all, the manner in which a

person meets the impact of senility is a highly specific one involving individual differences. It is the ability of the personality to meet this challenge that, to a large extent, determines future behavior.

Alleviation of fear and anxiety is of paramount importance. There is a level of anxiety which is entirely normal. However, when this level becomes intensified to a point where it interferes with normal thinking, then steps must be taken to control it. In the majority of cases, a little more knowledge and insight into the whims of emotions would add considerably to the comfort of these patients. An effective aid in management is communication. The mind is an ethereal intangible something which can be approached through psychologic means, that is, by influencing the patient through precept and discussion. In the main, when a patient places himself in the care of a sympathetic and understanding physician and transfers to him his personal concerns and co-operates with him, the initial step towards effective management has been taken. The physician must be an interested listener; and by listening and talking to him, the therapeutic effort is greatly advanced. If the therapist is to occupy a position of trust and confidence and gain a modicum of omniscience and omnipotence, he should be a kind and sympathetic person.[4-7]

The importance of assuagement of fear and anxiety is seen in the following experiments done on animals. Experimental animals react favorably to such an avenue of approach. It has been demonstrated that when albino rats were "fondled" for ten minutes daily for three weeks after weaning, they exhibited greater weight gain, more activity and less nervousness as compared to a controlled group. It was found that the animals thrived in proportion to the degree of "petting." As adults, they could be exposed to prolonged excitation with less physiologic changes to the cardiovascular, endocrine and gastrointestinal systems, as shown by immediate necropsy, than could the ungentled controls. Weininger[8] noticed that the adrenal glands of the gentled animals actually weighed less than those of the controls, and hypothesized that the relative immunity to stress damage seen in the fondled or gentled rats may have resulted from lessened pituitary output of ACTH in response to fear stimuli.

Mental hygiene will do much to help the aged. Physicians should be in the vanguard of promoting social and economic means whereby these people would be able to receive adequate emotional gratification through part-time employment, education, rehabilitation and other resources. Many of the aged will be able to return to society except for relatively minor restrictions calling for increased rest, diet and active exercise. Disuse tends to make a person feel inadequate and dependent. Reduction of emotional support is a chief factor in hastening regression and dependence. Community organizations should take the brunt of planning for these older people. There should be a plan for educating people in the problems of the aged. Public communication through lecture halls and other (forms of) media should be utilized to bring education to the aged as well as education about the aged. Thewlis[9] states "to grow old gracefully is an art" and that our attitude towards the aged should be a positive one and not a negative one. Unfortunately, human sympathy is world-wide in scope but not in action.

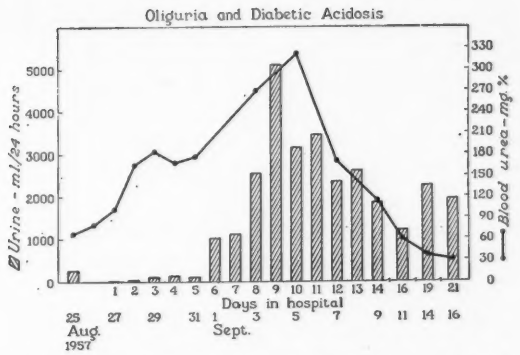
The approach to the aged must be an holistic one which includes: the lessening of fear and agitation, supplying of emotional re-assurance, the use of psychopharmacotherapy, the striving for an ideal patient-doctor rapport with attempts to give the aged insight as well as physical care—to keep them functioning.[10] Hence, in summary there should be a program of re-education, re-integration and re-orientation.

References

1. Nielsen, J. M., and Thompson, G. N.: The Engrammes of Psychiatry. 1st Ed. Springfield, Illinois: Charles C Thomas, 1947.
2. Sands, I. J.: The Neuropsychiatric Disorders of the Aged. New York J. Med., 51:2370 (Oct.) 1951.
3. Seidenfeld, M. A.: Psychological Aspects of Medical Care. 1st Ed. Springfield, Illinois: Charles C Thomas, 1949.
4. Tortora, A. R.: Acute myocardial infarction: Changing concepts about prolonged bed rest. M. Times, 86:700 (June) 1958.
5. Tortora, A. R.: What about the psyche? Resident Physician, 5:116 (Jan.) 1959.
6. Tortora, A. R.: Mental rehabilitation of the patient with myocardial infarction. Delaware M. J., 30:298 (Oct.) 1958.
7. Tortora, A. R.: The impact of acute myocardial infarction. Missouri Med., 56:147 (Feb.) 1959.
8. Weininger, O.: Physiological damage under emotional stress as a function of early experience. Science, 119:285, 1954.
9. Thewlis, M.: The Care of the Aged. 4th Ed. St. Louis, Missouri: C. V. Mosby, 1942.
10. Tortora, A. R.: The holistic approach in management of somatic symptoms of emotional origin. Arizona Med., 16:96 (Feb.) 1959.

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Diabetic Acidosis Complicated by Acute Renal Failure



Output of urine and content of urea in the blood, August 25 to September 16, in patient with diabetic acidosis complicated by acute renal failure.

● *Under the best of conditions, administration of the correct amounts of electrolytes and fluids in the treatment of diabetic coma poses a most difficult problem. The complexities of management are multiplied when renal failure complicates diabetic acidosis. This case report outlines the treatment in such a combination.*

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IN MOST instances of diabetic acidosis, there is a degree of azotemia which is rapidly ameliorated by rehydration and correction of the acidosis.[1] This can be attributed to both increased breakdown of protein (gluconeogenesis) and to changes in renal function. Decreases in renal blood flow, the glomerular filtration rate and specific tubular functions during acidosis have been demonstrated by Bernstein and associates.[2] Reubi has shown that hemoconcentration and increased viscosity of the blood will explain the observed renal ischemia.

Circulatory failure has been regarded by Howard[3] and Danowski and associates[4] as a common finding in patients dying of diabetic acidosis. A decrease in total peripheral circulatory resistance, with some increase in cardiac output, was observed by Howarth and associates[5] by means of cardiac-catheterization studies among patients in diabetic acidosis. The occurrence of such circulatory failure has been attributed to depletion of salt,[4] to the low pH of body fluids[6] and to hypokalemia.[7] Even a slight degree of peripheral circulatory failure would be expected to intensify renal ischemia resulting from dehydration and increased viscosity of the blood.

Although azotemia usually is corrected quickly after rehydration, there are some instances in which the value for blood urea or creatinine continues to increase for a number of days before a return to a normal value commences.[8,9] Results of specific tests of tubular function also have been shown to return to normal only slowly in some patients, and on this basis Bernstein and associates[2] suggested that renal ischemia may cause a reversible organic lesion similar to, but milder than, a lower nephron nephrosis. The absence of initial oliguria perhaps could be ascribed to the diuretic effect of the glycosuria occurring during acidosis and the mildness of the process.

In a smaller number of instances, however, actual oliguria or anuria lasting several days may occur.[9-11] The cases reported are few, but in these cases the process has run a course very similar to that seen in acute renal failure after traumatic shock. Brody[12] reported two instances of oliguria in diabetic acidosis in which the renal changes found on postmortem examination were consistent with the presence of the "lower nephron syndrome."

Thus, three degrees of renal change occurring

in or following diabetic keto-acidosis can be postulated.

First is a decrease in renal function quickly reversible by treatment of the acidosis. Oliguria of a few hours' duration, with prompt recovery of renal function, has been described[13] and would fall in this category.

Second is mild organic tubular damage resulting in azotemia for a number of days but without initial oliguria.

Third is more severe tubular injury resulting in anuria or oliguria of varying degree and duration.

A direct toxic action of the ketonemia might be considered as a cause of the renal injury in diabetic acidosis, but we have no proof of this mechanism. Hypokalemic nephropathy ordinarily does not exhibit the oliguria and retention of nitrogen characteristic of this syndrome.

The case reported herein illustrates an example of oliguria or anuria developing during diabetic acidosis.

Report of Case

A thirty-one-year-old woman was admitted to the hospital at 3 p.m. on August 27, 1957, because of oliguria of approximately 41 hours' duration. She had been completely well until a month previously, at which time symptoms of weakness and loss of weight appeared. Polyuria, polydipsia and vulval irritation had been noted two weeks prior to the patient's admission, and nausea, vomiting, dyspnea and weakness became increasingly severe during the 5 days before admission. Repeated questioning revealed no known exposure to any toxic agents.

The patient had become comatose on August 25, and at the time she was first seen by her referring physician* she was incontinent and apparently was passing urine freely. At 12:00 noon on that day (August 25) the value for blood glucose was 580 mg. per 100 cc., the carbon dioxide-combining power was 9.6 mEq. per liter of plasma, and the urine exhibited grade 4 albuminuria, glycosuria, acetonuria and casts. The patient received 100 units of crystalline insulin, and during the next 6 hours 2000 ml. of 1/6 molar sodium lactate and 20 mEq. of potassium chloride were administered intravenously. During the seventh hour of treatment she became cyanotic, and respirations were shallow. An electrocardiogram showed a bigeminal rhythm with premature ventricular systoles and depression of the S-T segments. She was quickly given 6 mEq. of potassium chloride intravenously, followed by 14 mEq., administered more slowly. Improvement resulted within ten minutes with a reversion to sinus rhythm and deeper respirations. She excreted only 250 ml. of urine in the first ten hours, and thereafter excreted only a few milliliters until August 28, when she excreted 30 ml.

The use of solutions of glucose and potassium chloride was continued, and she received 25 units of insulin every six hours. The value for potassium on the morning of August 26 was 2 mEq. per liter of serum, and the carbon dioxide-combining power was 17.2 mEq. per liter. She began to recover consciousness during the evening of August 26, about thirty-two hours after the start of treatment.

The patient was transferred to a Rochester hospital on August 27 because of continued oliguria. During the preceding fifty-one hours of treatment she had received a total of 7 liters of water, 120 mEq. of potassium, 450 mEq. of sodium, 270 mEq. of chloride, 300 mEq. of lactate ion and 275 units of insulin.

We found the patient to be stuporous. She responded inconsistently to questions. The respirations were somewhat increased in rate and depth, and the hepatic margin was palpable and tender. There were no râles or peripheral edema. The carbon dioxide-combining power was 10.3 mEq. per liter of plasma, the value for blood glucose was 323 mg. per 100 cc., that for potassium was 2.6 mEq. per liter of plasma and that for blood urea was 102 mg. per 100 cc. Only a trace of acetone could be found in the plasma by acetone test powder, and no salicylate ion could be demonstrated.

She was given 100 units of crystalline insulin subcutaneously, and within three hours the blood sugar had decreased to 168 mg. per 100 cc., and no acetone could be found in the plasma. It was concluded that the diabetic acidosis was largely corrected. Subsequently she was given 10 to 37 units of insulin daily.

A total of 2150 ml. of fluids was given intravenously during the first twenty-four hours after admission of this patient. This contained 305 mEq. of sodium, 265 mEq. of chloride and 40 mEq. of lactate ions.

Improvement in strength and alertness was gradual. Tube feedings of a 20 per cent solution of glucose and a prepared nutrient (lipomul) were given on the second and third days of hospitalization, and a rice and fruit diet was permitted on the fourth, fifth and sixth days. During the period of oliguria the oral intake was kept between 370 and 400 ml., except on August 29, when 1370 ml. was given. A graduated diabetic diet was begun the seventh day, but was taken poorly the first few days. The changes in the blood urea are shown in the illustration. There was a gradual increase until a maximum of 323 mg. per 100 cc. of blood was reached on the tenth hospital day. Satisfactory urinary output began on the sixth hospital day and increased to a peak of 5100 ml. on the ninth day. The urine was found to contain albumin and casts. The liver was no longer palpable, and it was felt that the enlargement may have been evidence of mild congestion, since some degree of pulmonary congestion was seen in the roentgenogram of the thorax the day after admission. There is also the possibility that the hepatomegaly was the result of fatty infiltration. The prothrombin time and result of the thymol turbidity test were within normal limits on admission.

*Clinical observations made prior to admission of this patient to the hospital were kindly supplied by Dr. Lawrence O. Goodman, of Marshalltown, Iowa.

No hypotension was noted at any time.

The carbon dioxide-combining power remained between 10.3 and 12 mEq. per liter of plasma from the time of admission to the tenth hospital day, and only by the sixteenth day had it increased to 20.9 mEq. per liter. The plasma was not found to contain acetone on a number of occasions during this time, and the persistently low carbon dioxide-combining power was considered to be the result of accumulation of nonketonic acidic metabolic products, as well as being a reflection of hyponatremia. The value for sodium was between 123 and 128 mEq. per liter of serum during the first several days, but decreased to 116 mEq. per liter on the tenth hospital day after diuresis had begun.

Values for blood sugar were variable, ranging between 173 and 390 mg. per 100 cc. There was only occasional glycosuria however (when urine was available for analysis). No observations were made which would permit an accurate estimation of threshold, but the impression was gained that the threshold was considerably elevated.

The value for potassium was 2.6 mEq. per liter of serum on the first hospital day, and 60 mEq. of potassium phosphate was given intravenously during the first night. The value had increased to 3 mEq. per liter of serum by the next morning. No more potassium was administered because of the possibility of hyperkalemia with continued oliguria. There was a gradual increase to 4.6 mEq. per liter on the sixteenth hospital day.

The clearance of blood urea was 42.4 ml. per minute at a urinary volume of 4.1 ml. per minute and a urea content of 30 mg. per 100 cc. of blood on the twenty-first hospital day. The patient was dismissed on September 20, after twenty-five days in the hospital, and 18 units of NPH insulin was prescribed to be taken daily.

This patient returned for re-examination on January 21, 1958. The diabetes had been difficult to control, and she was experiencing occasional reactions of hypoglycemia. She was feeling well generally. The clearance of urea was now 86.7 ml. per minute at a urine volume of 9.88 ml. per minute and a urea content of 36 mg. per 100 cc. of blood. Urinalysis revealed no albuminuria and no formed elements.

Comment

The renal failure which follows traumatic shock generally is regarded as the consequence of renal ischemia and the resulting injury to the tubular epithelium. The similarity between the clinical course exhibited by this patient and the usual post-traumatic "renal shutdown" may be taken as circumstantial evidence of a common mechanism. The direct demonstration by Reubi of decreased renal blood flow resulting from dehydration and increased viscosity of the blood is additional evidence for this view.

In this case oliguria was present from the time the patient came under medical observation, only 250 ml. of urine being formed within the first 10 hours. It is likely that the extensive dehydration and hemoconcentration after several weeks of polyuria are adequate to explain the initial oliguria. The episode of cardiac arrhythmia occurring at the seventh hour of treatment could well have caused additional renal ischemia and tubular injury.

In most instances of diabetic acidosis the kidney retains some ability to dispose of excessive loads of water or electrolytes. Thus, treatment can be undertaken with confidence that, if circulatory failure does not develop, the administration of modest excesses of water or salts will not harm the patient. If oliguria or anuria develops, however, the attending physician is deprived of this degree of freedom in the choice of fluids to be given parenterally. He must estimate water and electrolyte requirements as precisely as possible and avoid the equally hazardous pitfalls of inadequate and excessive therapy. The extensive distortions of cell composition and of extracellular fluid structure that have occurred during the period of development of the acidosis make it particularly difficult to know when enough of the various electrolytes and water has been given. Certainly, it is not enough to aim for normal composition of the plasma alone. Too often there is the ironic comment, "The carbon dioxide-combining power was back to normal, but the patient died."

Once the physician feels that water and electrolyte deficits have been corrected in the oliguric patient, there is the problem of administering sufficient amounts of carbohydrate without excessive water; he must prevent hypoglycemia and meet the metabolic needs of an unstable diabetic patient without increasing total body water. The amount of water that can be administered safely to an anuric patient has been estimated to be about 400 ml. per day.[14] Reasonably good diabetic control during the period of oliguria is all-important, since poor control would permit an accelerated catabolism of body protein and would result in a more rapid increase in the degree of azotemia.

Summary

Oliguria of six days' duration occurring in the course of diabetic acidosis is described. The patient recovered, and there was no evidence of renal dysfunction three months later. Renal ischemia and the resulting tubular injury are regarded as the most likely causes of such oliguria.

(References on Page 1112)

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Levator Spasm Syndrome

Presented at the meeting of the Minneapolis Academy of Medicine, Minneapolis Club, February 17, 1958.

IT IS the purpose of this discussion to bring to your attention a relatively common ailment seen in proctologic practice and in practice, in general. It has been adequately described by George H. Thiele in a series of papers in the last twenty or so years. Generally speaking, it is described as a painful spasm of the levator ani, coccygeus and the piriformis muscles, either separately or as a group. The syndrome, in my experience, is distinguished in part from true coccydynia because actual pain or soreness in the coccyx is lacking entirely in about one-half or more of the cases. Those cases in which actual coccygeal symptoms are absent or difficult to elicit have vague, indefinite, yet annoying or disabling "rectal" discomfort.

The cases to be emphasized and discussed are distinguished from those in which the primary symptoms are localized in the tailbone. Sir J. Y. Simpson, in 1859, called attention to the fact that when the coccyx was injured or when any of the group of surrounding tissues were the seat of inflammation, any contraction of the muscles attached to the coccyx resulted in the characteristic pain of coccydynia. He made no mention, however, of muscle spasm nor did he discuss any etiologic factors other than trauma.

Thiele emphasized spasm of certain muscles inserted into the lateral border of the coccyx as being responsible for the pain. These muscles include the levator ani, coccygeus and bundles of fibers from the gluteus maximus. He also noted that about one-third of these people also complained of pain in the superior gluteal region and down the back of the thigh and that, without exception, these patients had tenderness and spasm of the piriformis muscle.

Inflammation is considered by most investigators as the chief etiologic factor in this syndrome. This involves, particularly, infection in adjacent pelvic viscera causing reflex spasm of the pelvic floor muscles. Thiele referred to this as focal infection and includes such entities as anal fissure, hemorrhoids, proctitis, prostatitis, urethritis, cervicitis, salpingitis, et cetera.

Traumatic factors are occasionally responsible.

TABLE I. CLASSIFICATION (AS TO ETIOLOGY)

I. Inflammation:		
	(a) Male:	Urethritis
		Seminal vesiculitis
		Prostatitis
		Cystitis
		Anal fissures, hemorrhoids, proctitis, et cetera
	(b) Female:	Cervicitis
		Salpingitis
		Cystitis
		Vaginitis
		Anal fissures, hemorrhoids, proctitis, et cetera
II. Trauma:		
		Childbirth
		Fall, kick, or other direct trauma
III. Psychogenic:		
		Hysteria
		Neurosis

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These include falls, pregnancy, parturition, bumps against furniture, prolonged automobile rides and a few other miscellaneous injuries. In my own personal experience and on a number of occasions, I have been unable to establish a positive etiologic factor for the pain and spasm. It seems in these cases that the general loss of tonicity of the pelvic muscles, particularly in women, and poor sitting posture is the fault. Many of these people are confirmed slumpers who sit in such a way that the pressure is exerted over the upper buttocks, coccyx and base of the sacrum. It also seems that this poor posture may produce undue fatigue and spasm of the supporting pelvic muscles.

Many, including Thorek, consider this syndrome to be of psychoneurotic origin. Those in particular who consider the patient's symptoms vague and indefinite and who cannot find definite etiologic factors are likely to label him "neurotic." This, in my opinion, is an admission of defeat. Occasionally patients suffering from this entity have a cancer phobia. This can be dispelled by a careful examination, a clear description of the difficulty, re-assurance and treatment.

The syndrome is most prevalent in adult women and is most common in the fourth decade of life. In my own series, about 80 per cent were women and this percentage corresponds with Thiele's, Foster's and Duncan's experience.

TABLE II. AGE INCIDENCE

Age	Patients
23 to 30	4
30 to 40	34
40 to 50	58
50 to 60	46
60 to 70	7
74	1

Most of us are familiar with the symptoms of a painful coccyx, particularly those symptoms associated with fresh or recent trauma. Invariably these patients complain of a sore tailbone and find it difficult to sit unless the weight of the body is shifted away from this bony appendage. History of recent trauma makes the diagnosis obvious.

In my experience, the most common symptoms associated with levator spasm (Thiele's syndrome)

are often vague and sometimes it is difficult for the patient to describe or localize them. It is commonly referred to as an aching or discomfort in the rectum or pelvis. On close questioning, the patient describes it as an aching or throbbing, at times reaching an agonizing intensity. Sometimes an acute, severe attack may be experienced at night, awakening the patient and lasting several minutes to an hour. This group of symptoms has been described under the term "proctalgia fugax."

In contrast to the pain associated with anorectal disease, this aching is not particularly accentuated by bowel movement and in most cases, suggestions of existing anorectal disease such as protrusion, bleeding, and so forth, are entirely lacking. The symptoms may be present for a few weeks to a year and sometimes may follow anorectal surgery. Most of these people do not tolerate long automobile rides, prolonged sitting in slumped positions or occasionally long standing in one position.

Diagnosis

Because of the peculiar complaints and lack of associated symptoms, the difficulty is often overlooked or not considered at all. That old moss-grown adage "one finds what one looks for" certainly applies here. Only too often, many of these people have carried their complaints to numerous gynecologists, urologists, orthopedists, chiropractors without any organic difficulty having been recognized. I have been amazed on numerous occasions at the complicated examinations to which these patients have been subjected without any conclusive or positive findings having been recorded or any treatment suggested. Still others have been commonly diagnosed and treated for such maladies as prostatitis, pelvic inflammatory disease, sciatica, and slipped disc.

It is commonly observed that most of these people sit in a slumped position, resting the weight of the body on one buttock or the other. Most of them complain of accentuation of pain when rising from a sitting position or when they attempt to sit squarely on a chair. The most common physical finding on digital examination is tenderness and spasm of one or more of the pelvic floor muscles, the offenders usually being the levators, coccygeus or the periformus. The affected muscle or muscles will often feel contracted and spastic. This gives the sensation that the muscle is actually larger than normal. If only unilateral involvement is present, the uninvolved side feels flat and relaxed. In cases of true levator spasm syndrome, the coccyx is not painful on bi-digital examination. Application of pressure to the involved muscle will reproduce or intensify the pain which caused the patient to seek relief. In the majority of cases, the involvement is unilateral and for some unexplained reason often left and anteriorly. It should be emphasized, however, that this difficulty is not necessarily limited to one side or one group of muscles on one side of the pelvis. In Foster's cases, the coccygeus was most often involved. In Thiele's and my cases, the levators were most commonly involved.

Examination may be done in the inverted or left Sims's position. The gloved finger is inserted the full length of the rectum, the flexor surface being just anterior to the coccyx and sacrum. Bi-digital examination of the coccyx may produce some tenderness. As the finger is moved laterally, anteriorly and medially it passes over the piriformis, coccygeus and levator muscles. Only part of the periformus can be felt with the tip of the finger while most of the coccygeus and the levators can be felt as they proceed to their insertion to the coccyx and sacrum. The spastic tender muscles have the characteristics described. If this disease goes untreated for years, the affected muscle due to continued spasm may become small and feel like ligamentous or fascial bands.

X-ray is of little or no value in the diagnosis. Occasionally severe unilateral spasm of the levator ani and the coccygeus may pull the coccyx to the affected side. This, however, can be demonstrated by physical examination and x-ray contributes little, if anything, as an additional diagnostic measure.

The hip and leg pain which often accompanies this syndrome is usually due to spasm of the piriformis muscle. Spasm of this muscle will often produce pressure on the sciatic nerve as it merges through the sacro-sciatic foramen and on the superior gluteal nerve as it passes between the upper border of the spastic piriformis and lower border of the gluteus maximus. Spasm of the piriformis is concommitant with spasm of the levators and the coccygeus in approximately 25 per cent of the cases.

The diagnosis of this syndrome rests upon the demonstration of a spastic tender muscle or muscles of the pelvic sling. Inflammatory disease of the anorectum and adjacent viscera should be sought but in most instances it cannot be demonstrated.

Treatment

The treatment of this spastic muscle syndrome consists of massage of the involved muscles and/or surgical or medical control of the inflammatory processes if any are present. Massage is best accomplished with the patient in the left Sims's position. The index finger is inserted the full length of the anus with the flexor surface anterior to the coccyx. With gentle but firm pressure the finger is drawn over the bellies of the spastic muscles in a posterior-anterior stropping motion. If the muscles are acutely tender, having the patient bear down may help to relax the tender muscle and the massage is better tolerated. Massage is continued on each side for fifteen or twenty strokes, which takes about five minutes. This is repeated daily for four or five days and then every other day until improvement is shown. It is wise to advise the patient that after the first or second treatment the pain may be accentuated temporarily. After half a dozen treatments, most patients show a definite improvement. Massage is then continued at regular intervals until the pain has disappeared and no further treatment is necessary.

At home, the patient is advised to take sitz baths, warm water enemas and aspirin as an analgesic. Drugs designed to reduce muscle spasm have been of no value in several of my cases. Voluntary contraction and relaxation of the gluteus maximus and the pelvic sling muscles is valuable exercise to improve the tone of these muscles and reduce spasm. This can be done hundreds of times per day without any inconvenience and it seems to be particularly valuable in women with loose, sagging pelvic muscles. Instructions as to proper sitting posture are highly important. These people must be warned not to sit in a slumping position. The best posture is sitting on a firm surface with very little give and allowing the weight to rest upon the ischial tuberosities and muscles of the back of the thigh. Slumping with the lower back convex and the body weight exerted upon the sacrum and coccyx definitely aggravates and perpetuates the trouble. Diathermy has been of some help but only when used with frequent massage. Coccygectomy is to be avoided except in rare cases of fracture, osteomyelitis, et cetera. Thiele reported five cases in which coccygectomy had been done without relief of symptoms. Upon massage, four patients of this group were definitely improved and one remained the same.

Correction of local anorectal disease is sometimes of value in those cases which do not respond to massage. Likewise, diseases of the neighboring viscera should be treated as part of the program. This includes pelvic inflammatory disease, cystitis and cervicitis. Only 40 per cent of the cases seen have been found with associated diseases in the neighboring organs which leaves 60 per cent with no demonstrable etiologic factors. In those cases in which no definite etiologic factors were present, recurrence of symptoms not infrequently occurred, not unlike tender and spastic muscular conditions in other parts of the body. Massage in these cases relieved the symptoms but it was no guarantee that spasm and pain would not recur. The patient should be warned of the possibility of recurrence and advised that additional treatment may be necessary from time to time.

Summary

Levator spasm syndrome is a common difficulty frequently overlooked or mistaken for something else and often going untreated for years. Nearly all of these patients complain of pain in the general region of the rectum. The diagnosis is easy. The treatment is simple and readily administered and the results are most gratifying.

Discussion

R. J. Tenner, M.D.: I would like to thank Doctor Smith for this fine presentation of a very hard-to-explain condition in the rectum. This can best be described as a "charley-horse" or a cramp in the muscles that surround the rectum, namely, the levator ani and coccygeus muscle. The patient might describe it as similar to a cramp in the muscles of the calf which, of course, one can readily rub out and relax. This is also the accepted treatment by the physician for the spasm of the rectal muscle, namely digital massage.

Mancell T. Mitchell, M.D.: Parturition naturally places considerable strain and stretch upon the levator ani muscles, the sacro-coccygeal joint and the sacro-coccygeal ligaments. There may be considerable bruising and stretching of the soft tissues surrounding and overlying these structures. Occasional hematomas are seen. Operative deliveries and precipitate deliveries increase the likelihood of this.

Rest, as traditionally emphasized by the "lying-in" period, has been the principal therapeutic agent in treating this. Hot baths, hot douches and occasionally diathermy have been used as adjuvants.

In the cases that are slow to respond, massage as indicated by Doctor Smith, may play a decidedly helpful role in helping to relieve the pain and discomfort.

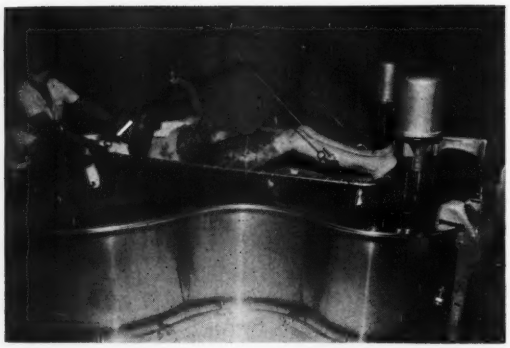


Fig. 1. Patient is being lifted from the tank after all dressings have been removed. This demonstrates the comfort and ease of handling a heavy patient by means of the power-operated overhead hoist.

● *Few things are as time-consuming for the physician and as painful for the patient as the changing of dressings in severe burns. Submersion of the burned patient in agitated water in a Hubbard tank can provide great aid in the management of such patients. This treatment does not interfere with but rather is of assistance in skin grafting.*

Use of the Hubbard Tank as an Adjunct in the Management of Severe Burns

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THE TREATMENT of burns can be divided into three very important phases: (1) immediate and supportive care, (2) preparation of the recipient sites for grafting and (3) actual placement of the grafts and their aftercare.

Like so many other aspects of medicine the success of the care that follows rests heavily on the thoroughness and effectiveness of the earlier phases. Any change from tried methods must be accompanied by mature consideration and naturally by uneasiness. On the other hand, if a change in method can be easily incorporated into the over-all scheme of therapy with a saving in discomfort and hospitalization without jeopardy to the patient, then the change is a good one.

Methods of Débridement of Extensive Third-Degree Burns in Preparation for Grafting

Severe burns, particularly those involving areas that are difficult to dress, such as the thorax, abdomen, upper part of the thighs and buttocks,

often represent real nursing problems after the initial acute phase is passed. In the large or obese patient the problems are magnified. It is particularly in these patients that use of the Hubbard tank is a definite aid in the care of extensive second and third-degree burns.

Several methods are described for the removal of eschars in preparation for grafting.

1. Moist dressings that are changed at regular intervals are used by many,[1] but this method is time-consuming, actually requiring many days to

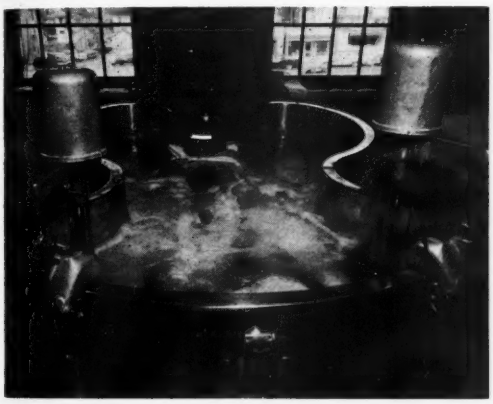


Fig. 2. Patient is immersed in the tank. Note the turbulence created by the two electric turbines at the foot end of the tank. Note also the ease with which a large person is accommodated in this tank.

float off eschars even with the use of half-strength Dakin's solution or weak acetic acid solution.

2. Enzymatic débridement is theoretically ideal but it presents real problems. Penetration of the eschar is practically impossible without cross hatching and by so doing one may damage granulations underneath. Furthermore, its use is moderately painful and is expensive.

3. Surgical excision with the patient under anesthesia has been described by Mason[2] as the most logical and generally accepted procedure for early removal of slough. It is accompanied, of course, by the small but definite risk of anesthesia, the spiking fever and chills that often follow in the first 24 hours after surgical débridement, and the inevitable loss of blood from manipulation of delicate granulations under the eschars when the latter are excised. Artz and MacMillan[1] have expressed the view that excision of the eschar is rarely indicated.

4. We feel that immersion of the patient in water and gentle cleansing by the method to be described offer a most satisfactory means of preparing an extensive burn for grafting. Also that by this method, second-degree burns very frequently may be more rapidly and effectively "cleaned up" and re-epithelization hastened.

Use of Hubbard Tank.—The tank that we now use is actually the Currence modification of the Hubbard tank.* It is a commercially built tank which is about 8 feet long, has the shape of a figure 8, allows depth of water to about 18 inches and has two electrically operated turbines† which pump aerated streams of water in any desired direction. It is of stainless steel, is easily cleaned and can be made essentially sterile before the patient is placed in it. The agitators in the tank

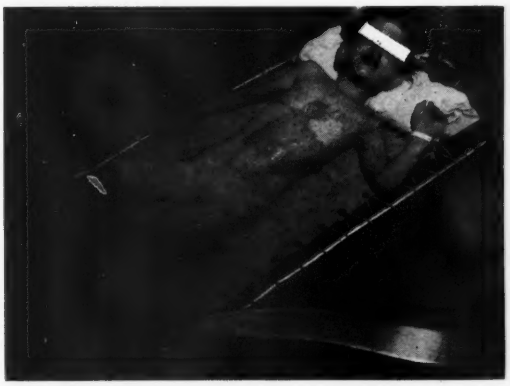


Fig. 3. An eight-year-old child at the time of her second tubbing. All dressings have been removed in the tank without traumatizing the burn wound in any way. Loosened eschar can now be removed in the tank with sterile instruments.

are of benefit in loosening the adherent dressings and eschar; warm water gently agitated to form currents or streams cleanses the patient more thoroughly and effectively than does unagitated water. The water used is from the city supply and enters the tank at whatever temperature is desired through a thermostatically controlled mechanism.

*Hubbard tank, 300 gallon capacity, made by Ile Electric Corp., Long Island City, New York.

†Agitator made by Ile Electric Corp., Long Island City, New York.

Some persons advocate saline baths, which are physiologically more sound but which practically are of little advantage. The additional expense of saline baths makes them not practical in most instances.

On about the seventh to the tenth day after the burn, the patient is taken to the department of physical medicine on a Stryker frame, lifted from the stretcher by an industrial electric hoist on an overhead track** and, except for the head and neck, is submerged in the water at a temperature of 100° F. The outer dressings are loosened or cut away. After fifteen minutes of soaking, the remaining dressings can be removed completely with ease and without pain. The edges of the eschars that are free are then lifted and excised.

Following this, 1 tablespoon of detergent (Dreft) is added to the water and the water is gently agitated by electrically driven turbines for another ten to fifteen minutes. The water with detergent more effectively loosens the accumulated secretions and epithelial debris than does the agitated water alone (Figs. 1, 2 and 3).

Then the patient is quickly removed from the tank, covered with a sterile sheet and transferred to a stretcher. The sheet is removed and nitrofurazone (furacin)-impregnated, fine-mesh gauze is layered smoothly over the areas of second and third-degree burn. Usually two physicians, masked and gloved, can apply the dressings rapidly enough to avoid chilling of the patient from exposure to the air.

In general, the decision for open or closed methods of care is based on several factors. Most burns of the arm and forearm are circumferential and also involve the hand. More comfort and easier immobilization in position of function are possible with contour compression dressings of the arm and hand. If the patient is ambulatory, contour dressings may be used on burns over the trunk and thighs. However, many times the extent of burns precludes ambulation, and the open method of management may seem wisest. In these cases, frequently a single layer of nitrofurazone gauze is all that is applied over the granulating areas, as this seems to prevent the drying and cracking of the surface of the granulations. A cradle is used to keep sterile sheets away from the areas covered by nitrofurazone dressings.

The eschars are removed easily, rapidly and relatively painlessly by "tubbings" every day or every other day. No loss of take of skin graft could be attributed to this type of preoperative treatment even when performed on the morning of grafting. In fact, as a usual procedure patients are taken from the tank, covered by a sterile sheet and brought to the operating room where the skin grafting is done. Some authors have expressed the belief that the granulations should not be cleaned too thoroughly because of the fear of removing the fibrin and "natural glue" so important to the take of a skin graft. We do not believe that there is a sound basis for this fear; rather, we think that gentle mechanical cleansing of the granulating areas is an important step in the preparation of the part to be grafted.

Frequently in the management of burns, after the general condition has stabilized and the patient seems to be progressing satisfactorily, the local care of the burn can become most arduous to both the patient and the physician. This seems to be especially true in children and in very obese adults as well as in very apprehensive patients. Since this stage in the handling of burns is most important, it follows that anything which makes life easier for both the patient and the physician, and speeds the time from burn to grafting, is to be desired. Use of the Hubbard tank in the manner described is most satisfactory in all these respects.

Illustrative Case

A thirty-seven-year-old housewife whose weight exceeded 200 pounds suffered a deep second and deep third-degree burn over 35 per cent of her body surface from an oil flame on March 14, 1958. The burn involved the right arm, forearm and hand, abdomen, flank and right thigh. After seven days' care at a local hospital she was transferred to the Mayo Clinic.

Her initial treatment here was supportive; electrolytes and blood were administered, and a liberal ulcer diet with protein supplements was used at first. Also, she was given additional tetanus antitoxin and tetanus toxoid and was started on chemotherapy.

A program of hydrotherapy was begun on March 25. The patient was submerged, except for the head and neck, for a total of twelve times at intervals of approximately every other day. On April 9, after the usual thirty-minute tubbing, she was taken to the operating room where split grafts were applied to the arm, forearm and hand, and postage stamp-sized split grafts were applied to the anterior and lateral aspects of the right thigh. Again, on April 15 and April 18, the tubbings were carried out without apparent deleterious effects on the grafts.

**Chisholm Moore Hoist Corp., Tonawanda, New York.

A review of the temperature chart showed no consistent change that could be attributed to the tubbings. In fact, the mean curve of the temperature was lower after March 29, but this could have been due to the alteration in chemotherapy.

This case was handled as indicated because the patient's weight and apprehension would probably have made dressing and local care of the burn most difficult by any other means of management.

Advantages of Method

This method of treatment has several advantages:

1. It is comfortable to the patient. Anesthesia is not needed for change of the type of dressing used and for débridement. Everyone who has experienced the anguish involved in change of dressings by other methods without anesthesia would be most impressed to see the relative ease with which all dressings can be removed, even in children, with only minimal sedation, usually with morphine sulfate, in the more apprehensive individuals.

2. It speeds care. Not only can depth of burn be ascertained as early as possible but the method shortens the time until grafting.

3. It reduces surface infection. Although some authors say that surface infection is not an important factor[3] it seems only reasonable that purulence causes the destruction of some of the precariously situated islands of epithelium. Patients treated as described herein are free of odor, do not show gross purulence at tubbings, and do not have spiking fever afterward.

4. It saves skin. Many questionably viable areas of epithelium are saved because the surrounding and covering eschar and infection are removed.

5. It helps in preparing granulations. As mentioned before, preoperative tubbings seem to have no deleterious effect on the take of split-thickness skin grafts even when done on the morning of operation.

6. It helps after grafting. Even after grafting, tubbing for ten to fifteen minutes five to seven days after split grafting helps float away eschar and areas of graft threatened by pockets of infection and serum. No loss of graft attributable to early tubbing has been noticed.

7. It saves blood. Because the patient seldom bleeds from sites where these eschars are gently teased and trimmed off, the total requirements for blood are much less.

8. It saves money. The cost of tubbing and new dressings each day is outweighed by the marked reduction in burn-to-grafting time.

9. It allows early active physical therapy of hands and arms as described by Wise and associates.[4]

Important Points of Management

For ease in management we believe, as does Jackson,[5] that the use of a Foley retention catheter facilitates care through at least the first two phases.

Nitrofurazone gauze placed lightly over granulations between tubbings keeps the surface from cracking and yet avoids maceration. We agree with Blocker and associates[3] that nitrofurazone gives good local antibacterial effect.

Septicemia, however, is an ever present threat to these patients, as pointed out by Artz and Soroff.[6] In their series of 800 burns the cause of death in 30 of the 53 deaths was septicemia proved by repeated blood cultures or by necropsy findings. For this reason, systemic chemotherapy generally is used.

We agree with Blocker[7] and Artz and Soroff[6] that ACTH and cortisone have no place in these phases of burn therapy.

The use of the industrial hoist on an overhead track greatly facilitates the procedure described.

References

1. Artz, C. P., and MacMillan, B. G.: Treatment of burns of difficult areas. Am. J. Surg., 91:517-520 (Apr.) 1956.
2. Mason, M. L.; Bell, J. L.; and Stromberg, W. B., Jr.: Pitfalls in the management of burns. S. Clin. North America, pp. 103-114 (Feb.) 1958.
3. Blocker, T. G., Jr.; Bass, J. A.; Lewis, S. R.; and Eade, G. G.: General aspects of microbial growth in the burn wound. Am. J. Surg., 95:309-311 (Feb.) 1958.
4. Wise, C. S.; Letterman, G. S.; Schurter, Maxine; and Fair, J. E.: Physical therapeutic aspects in the treatment of third degree burns. Arch. Phys. Med., 36:212-216 (Apr.) 1955.
5. Jackson, J. L.: Early care of burns. AMA Arch. Surg., 75:718-719 (Nov.) 1957.
6. Artz, C. P., and Soroff, H. S.: Modern concepts in the treatment of burns. J.A.M.A., 159:411-417 (Oct. 1) 1955.
7. Blocker, T. G., Jr.; Blocker, Virginia; Lewis, S. R.; and Snyder, C. S.: Experiences with the exposure method of burn therapy. Plast. & Reconstruct. Surg., 8:87-93 (July) 1951.

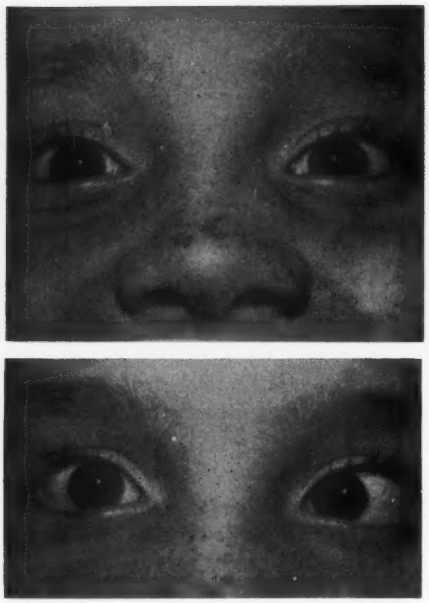


Fig. 1. Hirschberg (light reflex) test. (a) *above* parallel eyes with light reflex centered in each pupil; (b) *below* esotropic eyes with light reflex centered in right (fixing) eye, but off pupil of left eye.

The Detection of Strabismus in a Pre-school Examination

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The diagnosis of strabismus in pre-school children is quite simple and very important. The details of observation, the light reflex test, the cover-uncover test and the alternate cover test are presented.

STRABISMUS, or squint, may be defined as a lack of parallelism of the visual axes or the line of sight of the two separate eyes. The most common form of strabismus is esotropia; less common, are outward deviations or exotropia and vertical disparities or hypertropia.

Strabismus always involves both eyes even though one eye is constantly deviated. If that deviating eye be made to fix, the other eye will then deviate so that it is not too important to determine whether a squint is a right tropia or a left tropia or alternating. Ophthalmologists usually attempt to convert a right or left esotropia into alternating esotropia as part of the treatment of the strabismus.

In the detection of strabismus, as in all physical examinations, simple observation is the most important element in diagnosis. If to observation are added two simple tests, all instances of strabismus in children will be found. Since there exist certain physical peculiarities which tend to imitate or mask strabismus, it is important that these tests be added to the physical examination of children.



Fig. 2. Congenital epicanthus. Eyes appear esotropic, but are not. Light reflex is centered in each pupil.

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Part of a symposium on "Visual Examinations in Pre-School Children," presented at the Minnesota State Medical Association meeting, June, 1958.

The Hirschberg (Light Reflex) Test

The diagnosis of strabismus is greatly facilitated if one holds a light so that the reflection on the cornea of the child may be observed. If the child's eyes are parallel, the light reflex will be centered in the pupil of each eye (Fig. 1a). The reflection of a window or ceiling light serves equally well. This reflection will be in the same area of each cornea. If the eyes are not parallel, the light reflex will be in a different spot in each eye (Fig. 1b). One of the situations which gives the impression of strabismus is congenital epicanthus, an example of which is shown in Figure 2. At first glance, this child appears to have an esotropia, but it is apparent that the light reflex is centered in the pupil of each eye. The appearance of esotropia is due to the congenital epicanthal fold of skin at the side of the nose which covers part of the sclera in this area, particularly when the child glances to one side.

Cover-Uncover Test

To perform this test, first one eye and then the other eye is covered and uncovered while the child is fixing on a light or the observer's finger or anything which will hold the child's attention. If the eyes are aligned, they will hold this straight position. If the eyes are not straight, the deviating eye will jump to pick up fixation when the fixing eye is covered and this determines that the patient has a strabismus. This simple, rapid test can be done on very young children and is reliable providing only that the child is fixing on some object.

The Alternate Cover Test

In this test, the cover is passed from one eye to the other, alternately, allowing time for each eye to fix, but not allowing time for the two eyes to fix together with the cover removed. With this test, even normal eyes would jump a small amount to take up fixation, since a certain amount of phoria or tendency to deviate is normal. This is also a valuable test in a general physical examination, however, because moderate or large amounts of esophoria or even exophoria may require ophthalmologic attention and should be referred for consultation.

A refinement of these techniques is to combine the light reflex test and the cover test by having the child fix on a light and carry out the cover test. These tests can be done at the same time and take only an instant to perform if the child's interest is being held. Inclusion of these tests in all routine physical examinations of pre-school children will save many individuals from the cosmetic and functional blemish of strabismus and salvage the many eyes doomed to the partial blindness of amblyopia ex anopsia.

Metabolic Bone Diseases

The purpose of this paper is to present certain aspects of the calcium and phosphorus metabolism and metabolic bone diseases.

CALCIUM in human serum exists in two forms—the one which is ultrafiltrable and the other, which is non-ultrafiltrable. The ultrafiltrable calcium consists of ionic calcium and the calcium which is reversibly combined with the citrate.[1] Since the latter is negligible in quantity, the ionic calcium accounts for most of the ultrafiltrable calcium. The non-ultrafiltrable calcium consists of mainly the calcium which is reversibly combined with the proteins. Evidence in the literature indicates that calcium is also present in reversible combination with cephalin as non-ultrafiltrable calcium.[2]

The mean total and ultrafiltrable calcium, in the normals, as reported previously[3] are 9.84 ($\pm$0.46) and 5.24 ($\pm$0.214) mg. per cent, respectively. The mean percentage of ultrafiltrable calcium was 53.3 per cent ($\pm$2.48) when the pH of the serum ranged between 7.3 to 7.7 during the process of ultrafiltration.[3] These values for ultrafiltrable calcium are in agreement with those reported by McLean and Hastings[1] using frog heart technique and that of Yendt, Connor, and Howard[4] using *in vitro* calcification of cartilage of rachitic rats. Hopkins, Howard, and Eisenberg,[5,6] reported that the ultrafiltrable calcium in the normals was 65 to 75 per cent of the total if the pH of the serum was controlled by bubbling 5 per cent CO_2 in O_2 prior to ultrafiltration. Our results indicate that by bubbling 5 per cent CO_2 in the separated serum, an initial lowering of pH and increase in CO_2 content resulted, and the range of ultrafiltrable calcium in healthy human subjects was found to be 57 to 76 per cent.[3]

More recently, Toribara, Terepka and Dewey[7] reported that in normals the ultrafiltrable calcium is 60 to 70 per cent of the total, as determined by their method. A lowering of initial serum pH results if it is controlled by the method described by Toribara, Terepka and Dewey and this accounts for their higher values for ultrafiltrable calcium.[8] Our results show that by equilibrating the serum for thirty to fifty seconds instead of three to four minutes with 5 per cent CO_2 as done by Toribara and his associates, the pH of the residual serum ranges between 7.4 and 7.7 but the range of ultrafiltrable calcium remains essentially the same as reported by us.[8] In conclusion, it can be said that the higher values for ultrafiltrable calcium as reported by Hopkins and co-workers and Toribara and his associates are due to initial lowering of pH of the serum prior to ultrafiltration and we have suggested means to avoid this artefact.[3,8] Although 5 per cent CO_2 is regarded as a physiologic gas mixture, it's true only for whole blood. It is apparent that the pH of separated plasma can be decreased by prolonged exposure to 5 per cent CO_2.

Calcium-protein and calcium-cephalin relationship obeys the law of mass action. From statistical analysis it has been estimated that 1 gm. of albumin appears to bind 0.713 mg. of calcium.[9] Similar analysis in the normals showed that besides albumin, beta globulin also binds calcium.

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Approximately 50 to 55 per cent of the non-ultrafiltrable calcium is bound to albumin and the rest to beta globulin and cephalin. The ultrafiltrable calcium is freely diffusible in the extra-cellular fluid space and as such is of physiologic importance.

Ninety-nine per cent of the body calcium is stored in bone. Calcium is absorbed from the gastrointestinal tract. A high protein content in diet improves absorption, whereas a high phosphate diet interferes with its absorption. The poor absorption of calcium seen in the malabsorption syndrome associated with Sprue is not well understood. It is only partly due to poor absorption of fat-soluble vitamin D and probably not at all related to the formation of calcium soaps.

Calcium is excreted in the stool and urine. The stool calcium chiefly represents the unabsorbed dietary intake. Neuman and Chen[10] have reported that in dogs, roughly 99 per cent of the filtered calcium is reabsorbed by the renal tubules.

In addition to its role in the mineralization of bone, calcium is also important in neuromuscular physiology. The interrelationship with other ions with respect to neuromuscular irritability can be expressed by the formula:

$$\text{Neuromuscular irritability} = \frac{(Na)\ (K)\ (pH)}{(Ca)\ (Mg)}.$$

It is also important in activating certain enzyme systems such as thromboplastin. The anticogulant effect of oxalate or citrate depends on the binding of calcium ion to prevent this activation.

Ninety per cent of phosphorus in body is in the bone. A 70-kg. man would have a total of 540 gm. of phosphorus and only 54 gm. would be outside of bone. Almost half of the latter is in muscle, where it is an essential feature of the high energy bonds such as phosphocreatine and adenosine-triphosphate. Phosphorus participates in many other functions, such as buffering in acid-base balance.

Phosphorus is readily absorbed from the gastrointestinal tract and about two-thirds of it appears in the urine. Aluminum, calcium, iron, strontium, beryllium and other heavy metals combine with it and prevent its absorption. Normal level in the serum is 3 to 5 mg. per cent. It tends to rise during growth and under influence of an eosinophilic adenoma of the pituitary. It is also elevated in hypoparathyroidism, renal insufficiency and vitamin D intoxication. In respiratory acidosis produced experimentally in dogs, a marked increase of serum inorganic phosphate may depress ionic calcium which in the presence of hyperkalemia cause ventricular fibrillation and cardiac arrest.[11,12] Similar phenomena have been observed in post-hypercapnic patients undergoing major surgical procedures, as reported by Clowes and Simeone.[13] Phosphorus tends to fall after meals, or during recovery from diabetic acidosis, because it enters the cells. It is characteristically low in hyperparathyroidism. It is low in malabsorption syndrome

because calcium is not absorbed and this leads to hypocalcemia and secondary hyperparathyroidism with a phosphate diuresis. Phosphorus is excreted by the kidney and this is influenced by the parathormone.

There are two kinds of cells in the parathyroids, the chief cell and the oxyphil cell. Parathormone has two electrophoretic peaks.[14] There are two schools of thought in regard to the action of parathyroid hormone. One school believes that the hormone acts directly on bone tissue to cause its dissolution and that the electrolyte changes are secondary to the bone changes. The other school believes that the hormone acts on the electrolyte equilibria of the body fluids and that the bone changes, when they occur, are secondary to chemical changes.[15] According to the second school, the parathormone causes phosphate diuresis which tends to undersaturate the body fluids in regard to whatever equilibrium constant governs the serum calcium and phosphorus values. This leads to increased resorption of the calcium-phosphate salt from the bones and causes hypercalcemia and later hypercalcuria. However, Ellsworth and Futcher,[16] in nephrectomized dogs, were able to demonstrate a rise in serum calcium following parathormone administration. Other workers[17,18] were able to produce bone changes in nephrectomized animals with parathyroid hormone. Also the fact that one has osteitis fibrosa in renal insufficiency together with hyperplasia of the parathyroid suggests that the bone lesions are due to parathyroid hormone. It seems likely that parathormone probably produces phosphate diuresis and also has a direct action on bones.

Bone consists of organic matrix and inorganic matter. The matrix is composed of a groundwork of osteocytes and intercellular substances; the inorganic matter consists chiefly of calcium, phosphate and carbonate. The calcium salts of bone and enamel may be represented by the formula $CaCO_3 \cdot 2\ Ca_3\ (PO_4)$ (dahlite). The bone inorganic matter is in the form of crystals, which suggests formation by precipitation and hence the precipitation of the dahlite must be influenced by the calcium, phosphate and carbonate ion concentration of the extracellular fluid. Shear and Kramer[19] have described three steps concerned in the precipitation of calcium salts in the bone. The first step is the precipitation of secondary calcium phosphate ($CaHPO_4$); the second step is conversion of secondary calcium phosphate to tertiary calcium phosphate [$Ca_3(PO_4)_2$] and the final step is the adsorption onto a lattice work of tertiary calcium phosphate crystals of calcium carbonate or possibly of calcium hydroxide. Serum appears to be approximately saturated with respect to secondary calcium phosphate ($CaHPO_4$) and it is probable that the solubility product of this salt governs the levels of serum calcium and phosphorus.[15] The hypothesis as first suggested by Robison[20] holds that alkaline phosphatase, an enzyme made by the osteoblasts, by its action increases the inorganic phosphate locally in bone-forming surfaces, thus favoring dahlite deposition on bone surfaces. However, there is very little organic phosphorus in plasma for phosphatase to act upon. Gutman and Gutman[21] suggested that phosphoric esters formed during glycogen breakdown might serve as substrates for bone phosphatase. It is an established fact that cartilage preparatory to calcification accumulates stores of glycogen which disappear during the course of calcium deposition. Therefore, the immediate cause of calcification may be a localized increase of phosphate ions. This increase may result from the splitting off of inorganic phosphate from organic phosphorus compounds by alkaline phosphatase and for phosphorylase; the substrates for these enzymes to act upon may be built up by the enzyme phosphorylase. This concept has been forwarded by Albright.[15] However, it appears that no agreement has been reached on fundamental questions such as what is the nature of the bone mineral, and what is its solution property or its solubility product. Eisenberger, Lehrman and Turner as quoted by Neuman[22] have concluded that there is no single apatite crystal which will mean that bone is no longer a single phase. If the crystal does not exist as an entity, then neither does such a thing as a solubility product.[22]

According to Albright[15] vitamin D appears to have two independent mode of actions. The first is that it enhances calcium absorption from the gut. The second action is increased excretion of phosphorus in the urine, similar to that of parathormone. As a sequel to increased absorption of calcium from the gut, hypercalcemia results which will decrease the activity of the parathyroids and will thus tend to decrease urinary phosphorus excretion. However, in subjects with hypoparathyroidism, hypercalcemia will not be able to affect the parathyroids and as such the second action of vitamin D, namely the urinary excretion of phos-

phorus will go unabated and thus produces hypophosphatemia. Harrison[23] has reported that two phases in calcium absorption through the gut are present. The initial rapid absorption is probably due to simple diffusion of calcium from the proximal small intestinal lumen into the body fluids dependent on the presence of high concentration gradient. The second phase of calcium absorption represents absorption from the distal intestine. The pH of this portion of the intestine is high enough so that the concentration of calcium in solution is probably very low and absorption at this stage depend on an active transport mechanism requiring cellular activity and it is this phase of calcium absorption which apparently is increased by vitamin D. Harrison[24] has also reported a rise in the serum citrate levels following vitamin D therapy and that the administration of citric acid-sodium citrate mixture made the rachitic cartilage more calcifiable. However, a direct role of vitamin D in the intermediary metabolism of citrate has not been established. Harrison[24] showed that the mode of increased phosphate excretion in hypoparathyroidism following vitamin D therapy depended upon increased glomerular filtration rate whereas parathormone produced increased phosphate excretion by decreasing the tubular reabsorption. At present, it is believed that vitamin D and dihydrotachysterol (AT 10) are not different from each other with respect to their physiologic effects and since great variations in the batches of AT 10 were noted, vitamin D is preferred.

Classification of the Metabolic Bone Diseases
(Albright[15])

1. Too little calcified bone
   - A. Bone formation too little
     - (1) Defect in matrix formation: osteoporosis, osteogenesis imperfecta
     - (2) Defect in calcification of matrix: osteomalacia
   - B. Bone resorption too much: osteitis fibrosa
2. Too much calcified bone
   - A. Bone formation too great
     - (1) Increased matrix formation: elemental phosphorus poisoning, healed osteitis fibrosa generalisata and healed osteomalacia
   - B. Bone resorption too little
     - (1) Osteopetrosis (Marble bone disease)
     - (2) Hypoparathyroidism

It is important to make clear the differences between osteoporosis, osteomalacia and osteitis fibrosa, all of which are characterized by too little calcified bone. In osteoporosis the decrease of bone tissue is due to the fact that the osteoblasts lay down too little bone matrix; that matrix which is laid down is normally calcified. Thus, since osteoporosis is a disorder of tissue metabolism not of calcium and phosphorus metabolism, one is not surprised to find normal serum calcium and phosphorus levels. In osteomalacia there is too little calcified bone due to the fact that there is a disorder of calcium or phosphorus metabolism of such a nature that the calcium-phosphate-carbonate salt is not deposited in the newly formed osteoid. The bony tissue, therefore, is less resistant to stress and strain and this results in an overproduction of osteoid by the osteoblasts. This, in turn, results in a high serum alkaline phosphatase level. In osteitis fibrosa generalisata, there is a decrease in bone tissue as a whole because of increased bone resorption. This leads to decreased bone strength and this, in turn, to an increased activity on the part of the osteoblasts and hence to a high serum alkaline phosphatase level.

Causes of Osteoporosis

1. Defect in osteoblasts
   - A. Loss of stress and strain
     - (1) Atrophy of disuse
   - B. Lack of estrogen
     - (1) Post-menopausal state
     - (2) Congenital hypoestrinism: ovarian agenesis
   - C. Congenital osteoblastic defect
     - (1) Osteogenesis imperfecta
2. Defect in matrix
   - A. Loss of androgen
     - (1) Eunuchoidism
     - (2) ? Senile osteoporosis
   - B. Loss of protein
     - (1) Malnutrition
     - (2) Hypovitaminosis C
     - (3) Cushing's syndrome
3. Defect unknown
   - A. Acromegaly
   - B. Idiopathic osteoporosis

Osteoporosis in man, when due to a systemic cause, has a marked predilection for the vertebrae and pelvis and to a lesser extent, the skull and seldom involves the extremities. The lamina dura around the teeth, as seen by x-ray, is characteristically intact, an important point in the differential diagnosis between this condition and osteitis fibrosa generalisata.

Since the normal stimulus to the osteoblasts is stresses and strains, any enforced immobilization

(flaccid paralysis, plaster cast, et cetera) of all or part of the skeleton will lead to decreased osteoblastic activity and hence bone resorption continuing, to osteoporosis of the parts of the skeleton immobilized. Atrophy of disuse rarely affects the skull and the lamina dura remains intact, in contradistinction to osteitis fibrosa generalisata where the skull is one of the first to show involvement and lamina dura is affected. Atrophy of disuse is probably a factor in the osteoporosis of old age and may complicate other forms of osteoporosis by initiating a vicious cycle; for example, a patient with post-menopausal osteoporosis fractures a vertebra, is immobilized and acquires more osteoporosis. Since in osteoporosis, bone formation decreases and bone resorption continues unabated, hypercalcuria occurs and may lead to renal complications.

Post-menopausal osteoporosis is the commonest of all forms of osteoporosis. Estrogen stimulates endostial bone formation and testosterone enhances this action in pigeons. Similar effect in humans has been observed. A combination of diethylstilbestrol (0.5 to 1 mg. daily) and methyltestosterone (10 to 20 mg. daily) or testosterone propionate (10 to 25 mg. a week, I.M.) gives good results. This treatment can be interrupted for seven to ten days every four to six weeks. A high protein diet is also probably indicated.

Most of the changes of old age are, in the final analysis, due to atrophy; in terms of the skeleton, atrophy is osteoporosis. How much of the atrophy of old age is due to underfunction of the steroid-producing glands, and how much is due to old age *per se* are as yet unanswered questions. In many cases, osteoporosis of disuse, of malnutrition, of the post-menopausal state, and of senility are inseparably superimposed.

The part played by diet in osteoporosis is not well established. A diet inadequate in protein might lead to a negative nitrogen balance and this, in turn, might make it impossible for the osteoblasts to lay down the necessary organic matrix, which is the first step in the formation of bone. The second possibility is that an increased availability of calcium and phosphorus in the system as a result of increases in the diet would decrease the amount of resorption of bone. If such were the case, any primary hypofunction of the osteoblasts would be partially offset by the decreased resorption and the patient would be benefited. Such a hypothesis would explain the apparently beneficial effect obtained by Bauer and Marble[25] and by Adams, Boothby and Snell[26] in the treatment of patients with osteoporosis with diets high in calcium and phosphorus and large amounts of vitamin D. In thyrotoxicosis and long-standing poorly-treated diabetes mellitus, the prolonged use of protein for energy may result in deficiency in some constituent of protoplasm which is needed for bone matrix formation.

Osteoporosis in Cushing's syndrome is believed to be due to anti-anabolic effect of the adrenal steroid on the protoplasmic matrix of bone.

In acromegaly, osteoporosis may be related to hypogonadism which accompanies most cases. The other possibility is that the increased protoplasmic mass in acromegaly requires a higher nitrogen intake to keep in nitrogen balance. Thus there is a relative negative nitrogen balance which may result in too little material for the osteoblasts with which to build bone matrix.

Rickets or osteomalacia can be defined as a state of defective deposition of inorganic materials in cartilage or bone matrix, or both, from any one of the possibilities which will be mentioned.

A classification based on the pathogenesis of rickets and osteomalacia is as follows (Follis)[27]:

1. Disturbance in balance of matrix formation and/or destruction and deposition of inorganic elements.
   - A. Normal rapid matrix formation especially in the premature
   - B. Healing fractures
   - C. Healing scurvy
   - D. Healing osteitis fibrosa
   - E. Marble bone disease
2. Disturbance in absorption of calcium and/or phosphorus
   - A. Calcium
     - (1) Dietary
     - (2) Change in pH of intestinal contents
     - (3) Formation of insoluble complexes (PO_4, oxalate, phytin)
     - (4) Protein content of diet
     - (5) Diarrhoea
     - (6) Steatorrhoea
     - (7) Vitamin D lack
       - (a) Dietary
       - (b) Diarrhoea
       - (c) Steatorrhoea
       - (d) Absence of bile and pancreatic juice
       - (e) Phytin content of diet
       - (f) Impaired formation in skin
       - (g) Increased threshold for effect
   - B. Phosphorus
     - (1) Dietary lack
     - (2) Change in pH of intestinal contents

(3) Diarrhoea
(4) Formation of insoluble complexes (Ca, Sr, Pb, Fe, Al)

3. Excess excretion of Ca and/or Phosphorus
A. Renal disease
(1) Glomerulo-tubular disease
(2) Renal tubular acidosis
(3) Fanconi syndrome
(4) Idiopathic hypercalcuria
B. Lactation and Pregnancy

4. Obscure
A. Vitamin D intoxication
B. Tumor cells in marrow spaces

A few words should be mentioned about Marble bone disease and its association with rickets. It has been recognized that Marble bone disease is associated with rickets in most cases.[27] In this condition there is virtually a complete cessation of destruction of bone. The cartilage matrix impregnated with inorganic materials, plus the organic matrix impregnated with inorganic materials, are not removed. It is important to realize that the body has a tremendous store of inorganic materials which is continuously being made available by normal destruction to be deposited in new matrix, whether cartilage or bone. In Marble bone disease, this inorganic material is locked up in the skeleton. In other words, it is not broken down, and therefore, not released to be deposited in new bone matrix and new cartilage matrix which is being formed and which is ready to calcify. If the amount of inorganic material which can be absorbed is not sufficient, in the face of this lack of the normal turnover which should be present, a marked rachitic change is observed.

In tubular insufficiency, the formation of ammonia by the tubules is impaired. This causes loss of base including calcium which results in low serum calcium. This causes hyperplasia of the parathyroids which, in turn, causes hypophosphatemia. Low serum calcium and phosphorus thus results in osteomalacia. Furthermore in acidosis, the gastric acidity tends to be decreased which would decrease the calcium absorption from the gut. According to Albright these patients respond well to sodium citrate-citric acid mixture and vitamin D therapy.

In chronic glomerulonephritis where both the tubules and glomeruli are affected, a different sequence of events results. Hypocalcemia, as a result of hypercalcuria, induces parathyroid hyperplasia but owing to glomerular insufficiency, phosphorus is retained. High serum phosphorus, in spite of low serum calcium, helps in the deposition of minerals in the cartilage and bony matrix and thus should prevent osteomalacia. In this group, osteitis fibrosa (probably due to secondary hyperparathyroidism) is common.

According to Follis,[27] in chronic glomerular-nephritis in children and in adults, one does find excessive amounts of osteoid and hence the term renal rickets is a justifiable one. There are all gradations, from pure rickets to osteitis fibrosa in chronic renal insufficiency.[27] What the factors are which regulate the type of bone involvement are not known. Perhaps acidosis itself causes renal rickets, as observed in some children with rickets who have no decrease of the serum calcium and no marked decrease of the serum inorganic phosphorus level but who do have chronic acidosis. These patients respond to correction of acidosis alone.[27]

Fanconi syndrome is characterized by a hereditary tendency often accompanied by a family history of consanguinity, impaired growth beginning at an early age, rickets, albuminuria, renal glycosuria, alkaline urine, increased urinary excretion of organic acids, ammonia, phosphorus and calcium, lowering of blood bicarbonate (without azotemia) and degenerative changes in renal tubular epithelium. According to Albright, the acidosis may be due to increased urinary excretion of organic acids. The treatment is the same as in tubular insufficiency.

Vitamin D intoxication may be associated with rickets. The pathogenesis is not clear. Follis[27] postulates that osteoid formation is due to a direct stimulation by vitamin D, as this happens even on a low calcium and low phosphorus diet.

Pathologic evidences have been presented to show that rickets may be associated with leukemia and other malignancies, the pathogenesis of which remains unclear.

A calcium infusion test, as described by Nordin and Fraser[28] may be helpful in differentiating osteomalacia from osteoporosis. Briefly, this consists of giving the patient a four-hour calcium infusion and measuring the urinary excretion of calcium for twelve hours. Patients with osteomalacia excrete less calcium as compared to normals and patients with osteoporosis.

Classification of osteitis fibrosa based on pathogenesis (Follis)[27]:

(1) Acute severe inanition
(2) Acidosis (Local ?)
(3) Primary hyperparathyroidism
(4) Secondary hyperparathyroidism
(5) Hyperthyroidism
(6) Paget's disease
(7) Tumor cells in marrow cavity (Myeloma, leukemia, carcinoma, etc.)

In children who die very rapidly of diarrhea and acute infections, excessive destruction of bone is sometimes seen. In such cases, one finds excessive osteoclastic activity, and histologically one gets the impression that bone is being destroyed in such areas.

Hyperparathyroidism.—The clinical findings in primary hyperparathyroidism can be divided into (1) those due to bone disease, (2) those due to disease of the urinary tract and (3) those due to hypercalcemia, *per se*.

The bone disease when present consists of a generalized decalcification with superimposed cysts and tumors. All degrees of skeletal decalcification are encountered clinically—from the patient with no bone changes to the patient with practically complete loss of skeleton, dying of inability to raise his thorax in respiration. Bone tenderness is a very constant feature. All kinds of bone deformities occur. These include bending of the long bones, deformities of the pelvis similar to those seen in osteomalacia and various deformities of the vertebrae, crushed vertebrae and herniations of the nuclei pulposi through the end plates of the vertebrae. Bones are more brittle in this disease than in osteomalacia so that fractures rather than bending is the rule.

The symptomatology associated with the urinary tract may be divided into three parts: (a) that due to hypercalcuria and hyperphosphaturia, (b) that due to formation of kidney stones and (c) that due to calcium deposits in the kidney parenchyma. Marked polyuria and polydipsia are usually associated with the hypercalcuria and hyperphosphaturia and because of this several times a diagnosis of diabetes insipidus has been made faultily. In association with nephrocalcinosis, renal tubular damage may occur, which adds to the polyuria. Hypercalcemia causes decreased excitability of the nerve-muscle apparatus. Muscles are hypotonic. The lack of tone in smooth muscles may give rise to constipation and sometimes difficulty in swallowing. Calcium deposits in the deep conjunctiva of the palpebral fissure has been noted. These are well visualized by a slit lamp. Band keratitis has also been noted in the superficial layers of the periphery of the cornea and are most marked at the palpebral fissures.

In those cases of hyperparathyroidism associated with bone disease, leukopenia and anemia has been observed. In some the anemia responds to iron therapy.

Cases of hyperparathyroidism without recognizable bone disease do exist. Clinically the cases can be divided in the following four groups:

1. With bone disease and without kidney disease
2. With bone disease and with kidney disease
3. Without bone disease and with kidney disease
4. Without bone disease and without kidney disease

In classical cases, a diagnosis of primary hyperparathyroidism can be established if one finds hypercalcemia, hypophosphatemia with normal serum protein and increased serum alkaline phosphatase. Urinary excretion of calcium on a standard low calcium diet is increased. The phosphorus re-absorption test may be helpful in making a diagnosis in some cases. In certain instances where the serum calcium is normal, in association with abnormal albumin/globulin ratio, a determination of ultrafiltrable calcium, may be of definite value.[8] Often these tests have to be repeated two or three times before a decision can be reached. The above-mentioned investigations should be carried out, once the diagnosis of hyperparathyroidism has been suspected because of the finding of a calcium stone or certain bone changes, or because of certain symptoms suggesting hypercalcemia. The differential diagnosis should include other bone diseases which might be mistaken for hyperparathyroidism and other causes for hypercalcemia:

1. Demineralization due to metabolic bone diseases

A. Osteoporosis: In osteoporosis the serum calcium and phosphorus values with one exception, which will be mentioned, are normal. In early stage calcium and phosphorous excretion in urine are increased but later they tend to be normal or low. Hence, the hypercalcuria and the hyperphosphaturia disappear after the skeleton becomes demineralized in osteoporosis, in contradistinction to hyperparathyroidism where they persist regardless of the degree of decalcification. In osteoporosis, skull is almost never involved, the lamina dura is present and one does not find cysts and tumors in the bones. Only demineralization and deformities or fractures are seen.

In growing children, following extensive immobilization one finds serum calcium to be increased. Serum phosphorus is either normal or slightly elevated and serum alkaline phosphatase is normal. An analogous situation occurs in adults when a person with excessive

bone formation compensatory to increased bone destruction as with Paget's disease is suddenly immobilized.

B. Osteomalacia and Rickets: These characteristically have low serum calcium and urinary calcium excretion is also low. The bones are generally decalcified and lamina dura are absent; however, tumors and cysts are rarely, if ever found, in osteomalacia, and deformities occur as a result of bending rather than fractures.

C. Osteogenesis imperfecta: is an hereditary disease and probably involves all mesenchymal tissue. The osteoblasts fail to form the normal amount of extra-cellular substance. The sclerae are blue. The blood vessels, fascia, periosteum and subcutaneous tissues are all very pliable. When adult life is attained, otosclerosis may develop. The x-ray of the skull will show a very thin but not decalcified skull. The lamina dura is intact. Serum calcium and phosphorus are normal and there is no hypercalcuria or phosphaturia. Serum alkaline phosphatase may be slightly elevated. A family history is positive.

2. There are a few localized bone diseases which may be mistaken for hyperparathyroidism.

A. Polyostotic fibrous dysplasia or Albright's syndrome: This consists of (a) disseminated osteitis fibrosa with segmental distribution suggesting a neurologic or embryologic relationship; (b) areas of cutaneous and perhaps of buccal pigmentation which have a distribution suggesting some connection between them and the bone lesions and (c) sexual and somatic precocity in females but not in the males. The bone lesions may be widely disseminated but are not generalized; the uninvolved parts of the skeleton are normal. The bone lesions are hyperostotic as well as hypostotic; whereas, in hyperparathyroidism hyperostosis is most unusual. Thus in this syndrome, skull x-ray may show a marked increased density at the base of the skull, coupled with a localized increased thickening of the vault of the skull somewhat reminiscent of that seen in Paget's disease. Serum calcium and phophorus values are normal.

B. Paget's disease: The skeletal involvement is localized (i.e. not generalized) and there is a tendency to over-growth of involved bones. Serum calcium and phosphorus values are normal while the serum alkaline phosphatase is elevated.

C. Multiple Myeloma: This can produce a clinical picture which may be difficult to distinguish from hyperparathyroidism except for the presence of abnormal serum proteins and myeloma cells in the bone marrow. Serum alkaline phosphatase is rarely elevated in myeloma.

3. Among the conditions associated with hypercalcemia, the following deserve to be mentioned:

A. Hypervitaminosis D

B. Boeck's Sarcoid

C. Syndrome resulting from prolonged and excessive intake of milk and alkali (also called Burnet's syndrome). The clinical features are: (1) hypercalcemia without hypercalcuria, (2) a normal or high serum phosphorus level, (3) impaired renal function, (4) conjunctival calcium deposits and (5) lowering of the serum calcium level with clinical improvement when the patient is placed on a low calcium diet.

Once the diagnosis of primary hyperparathyroidism is established, the treatment is excision of the offending parathyroid adenoma, if one exists, or enough hyperfunctioning tissue to reverse the abnormalities.

By secondary hyperparathyroidism is meant a state of affairs where because of some modifying circumstance more parathyroid hormone is needed by the body than under normal circumstances. This occurs under the following circumstances: calcium deprivation due to diet, pregnancy, lactation, rickets and osteomalacia, and chronic nephritis.

Commonly, in hyperthyroidism one sees osteoporosis but sometimes one may find osteitis fibrosa. The exact mechanism for the latter is not understood.

Hypoparathyroidism.—The accidental removal of, or damage to, the parathyroid glands in the course of a thyroid operation is, of course, the commonest cause for hypoparathyroidism. Very rarely, hypoparathyroidism occurs idiopathically. There is some association of hypoparathyroidism with moniliasis. There seems to be a tendency for idiopathic hypoparathyroidism to be associated with Addison's disease.

The most striking clinical feature of hypoparathyroidism is the increase in neuromuscular excitability dependent on the hypocalcemia and producing the symptom-complex known as tetany. Other symptoms include: numbness of the extremities, cramps, carpopedal spasm, laryngeal stridor and generalized convulsions. Cataracts are very common. Symmetric, bilateral punctate calcifications of the basal ganglia of the brain tissue are not uncommon. Increased intracranial pressure with bilateral choked disc is another bizarre finding. Multiple ectodermal lesions are also frequently present. Once the condition is suspected from the clinical symptomatology, the diagnosis is confirmed by the characteristic chemical findings, namely, a low serum calcium, a high serum phosphorus, a normal or even low serum phosphatase level and usually absence of calcium in the urine.

Other conditions which cause tetany may be confused with hypoparathyroidism. For practical purposes there are two causes of tetany: hypocalcemia and alkalosis. It has been postulated that alkalosis tetany is due to a decrease in the ionic calcium. Our results in experimental dogs indicate that in respiratory alkalosis the ultrafiltrable calcium decreases only slightly and cannot account

for the presence of tetany on the basis of decrement in the calcium ion.[11] On the other hand, a marked rebound increase in the level of ultrafiltrable calcium in the recovery phase following hyperventilation was observed. This rebound increase in the level of ultrafiltrable calcium may be related to increased citrate in the plasma as reported by Axelrod[29] or to a concomitant decrease in the serum phosphate as suggested by us.[11]

The causes for hypocalcemia other than hypoparathyroidism are rickets and osteomalacia, and renal insufficiency with phosphate retention.

Pseudohypoparathyroidism has essentially the same symptomatology, chemical findings and physical signs as those of hypoparathyroidism, but the cause of the disturbance is not lack of parathyroid hormone but inability to respond to it. The syndrome has, in addition, certain developmental abnormalities, such as round face, thick and short stature, brachydactyly, especially as regards the metacarpal bones and soft tissue calcification.

Satisfactory treatment is achieved by vitamin D and calcium therapy in both hypoparathyroidism and pseudohypoparathyroidism.

Recently cases have been described as pseudo-pseudohypoparathyroidism where the clinical appearance of the patients are those of pseudohypoparathyroidism but serum calcium and phosphorus are normal.[30]

References

1. McLean, F. C., and Hastings, A. B.: The state of calcium in fluids of body. J. Biol. Chem., 108:285, 1935.
2. Drinker, N., and Zinsser, H. H.: The equilibrium between calcium and cephalin in various systems. J. Biol. Chem., 148:187, 1943.
3. Prasad, A. S., and Flink, E. B.: The effect of carbon dioxide on concentration of calcium in an ultrafiltrate of serum obtained by centrifugation. J. Appl. Physiol., 10:103, 1957.
4. Yendt, E. R., Connor, T. B., and Howard, J. E.: *In vitro* calcification of rachitic rat cartilage in normal and pathological human sera with some observations on the pathogenesis of renal rickets. Bull. Johns Hopkins Hosp., 96:1, 1955.
5. Hopkins, T. R., Howard, J. E., and Eisenberg, H.: Ultrafiltration studies on calcium and phosphorus. Bull. Johns Hopkins Hosp., 91:1, 1952.
6. Hopkins, T. R., Connor, T. B., and Howard, J. E.: Ultrafiltration studies. Bull. Johns Hopkins Hosp., 93:249, 1953.
7. Toribara, T., Terepka, A., and Dewey, P. A.: The ultrafiltrable calcium of human serum. J. Clin. Invest., 36:738, 1957.
8. Prasad, A. S., and Flink, E. B.: The determination of ultrafiltrable calcium in a variety of clinical conditions. J. Lab. & Clin. Med., 52:1, 1958.
9. Prasad, A. S., and Flink, E. B.: The base binding property of serum proteins with respect to calcium. J. Lab. & Clin. Med., 51:345, 1958.
10. Neuman, W. F., and Chen, P. S., Jr.: The renal clearance of calcium in normal dogs. *In* Metabolic Interrelations. Transactions of the Fifth Conference, Josiah Macy, Jr., Foundation, page 130, Jan. 1953.
11. Prasad, A. S., Brown, E. B., Jr., and Flink, E. B.: Plasma ultrafiltrable calcium in respiratory alkalosis and acidosis. Am. J. Physiol., 190:459, 1957.
12. Brown, E. B., Jr., and Prasad, A. S.: Plasma ultrafiltrable calcium concentration in posthypercapnia ventricular fibrillation. Am. J. Physiol., 190:462, 1957.
13. Clowes, H. A., Jr., and Simeone, F. A.: Acute hypocalcemia in surgical patients. Ann. Surg., 146:530, 1957.
14. Plimpton, C. H.: Calcium metabolism in health and disease. M. Clin. North America, p. 881 (May) 1955.
15. Albright, F., and Reifenstein, E. C., Jr.: The Parathyroid Glands and Metabolic Bone Disease. Baltimore: The Williams and Wilkins Company, 1948.
16. Ellsworth, R., and Futcher, P. H.: Effect of parathyroid extract upon serum calcium of nephrectomized dogs. Bull. Johns Hopkins Hosp., 57:91, 1935.
17. Collip, J. B., Pugsley, L. I., Selye, H., and Thomson, D. L.: Observations concerning the mechanism of parathyroid hormone action. Brit. J. Exper. Path., 15:335, 1934.
18. McJunkin, F. A., Tweedy, W. R., and McNamara, E. W.: Effect of parathyroid extract and calciferol on the tissues of the nephrectomized rat. Am. J. Path., 13:325, 1937.
19. Shear, M. J., and Kramer, B.: Composition of Bone. J. Biol. Chem., 79:125, 1928.
20. Robison, R.: The possible significance of hexose phosphoric esters in ossification. Bio. Chem. J., 17: 286, 1923.
21. Gutman, A. B., and Gutman, E. B.: A phosphorylase in calcifying cartilage. Proc. Soc. Exper. Biol. & Med., 48:687, 1941.
22. Howard, J. E.: Normal calcium and phosphorus transport and body fluid homeostasis. Metabolic interrelations. Transactions of Fifth Conference, Josiah Macy, Jr., Foundation, p. 39, January, 1953.
23. Harrison, H. E.: The effect of vitamin D on calcium absorption in rats with low phosphorus rickets. Metabolic interrelations. Transactions of Fifth Conference, Josiah Macy, Jr., Foundation, p. 155, January, 1953.
24. Harrison, H. E.: The relationships of vitamin D and parathyroid hormone to citrate metabolism. *In* Metabolic Interrelations. Transactions of Fifth Conference, Josiah Macy, Jr., Foundation, p. 307, January, 1953.
25. Bauer, W., and Marble, A.: Studies on the mode of action of irradiated ergosterol. J. Clin. Invest., 11:21, 1932.
26. Adams, M., Boothby, W. M., and Snell, A. M.: Metabolic studies in osteoporosis. Am. J. Physiol., 114:383, 1936.
27. Follis, R. H., Jr.: Diseases, particularly of bone, associated with derangements of calcium and phosphorus metabolism. *In* Metabolic Interrelations, Transactions of Fifth Conference, Josiah Macy, Jr., Foundation, p. 196, January, 1953.
28. Nordin, B. E. C., and Fraser, R.: A calcium infusion test, urinary excretion data for recognition of osteomalacia. Lancet, 270:823, 1956.
29. Axelrod, D. R.: Relationship of calcium and citric acid to hyperventilation in man. Proceedings, 49th Meeting of American Society Clinical Investigation, Atlantic City, 1957. J. Clin. Invest., 36:870, 1957.
30. Albright, F., Forbes, A. P., and Henneman, P. H.: Pseudo-Pseudohypoparathyroidism. Tr. Assoc. Am. Phys., 65:337, 1952.

Dispensing Drugs

House File No. 496

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Presented as testimony at a public hearing in the Commerce Committee of the Minnesota House of Representatives, Saint Paul, Minnesota, March 3, 1959.

AS ATTORNEY for the Minnesota State Pharmaceutical Association, I appear in its behalf in opposition to House File No. 496. This Bill proposes to amend Section 151.01 of the 1937 pharmacy law by adding another definition as Subdivision 14. It defines the term non-habit-forming harmless proprietary medicines. In effect, this definition declares thousands of drugs to be non-habit-forming, harmless proprietary medicines with utter disregard for the true facts and the opinions of the medical and allied professions and of their outstanding authorities in the field of medicine, pharmacology, pharmacy and others who are experts and capable to determine the facts and who are charged with the duties and responsibility of protecting public health and welfare. It also disregards the functions and decision of our state courts.

Who Wants This Bill Passed?

First, the appearance before the Committee of Dr. Fredrick J. Cullen, lobbyist, executive vice president of the Proprietary Association, which he has served for twenty-two years, indicates that the manufacturers of the so-called proprietary medicines are primarily interested in passing this Bill.

Second, the supermarket chain stores known as Red Owl Stores, Inc., and Groves-Kelco, Inc., wholesale distributors, are interested in passing this Bill.

Third, Earl Altnow, vice president of what is known as AMA of Minnesota, Inc. This is not the American Medical Association which many people may be led to believe; it is the Affiliated Merchants Association. It appears to be an organization primarily concerned with passing this Bill. It may be of interest to this Committee to know the viewpoint of Mr. Altnow a few years ago when he apparently was only representing the Minnesota Food Retailers Association as its executive secretary, and published bulletins known as *Minnesota Food Guide*. I have here Bulletin No. 2, Volume 5, of the *Minnesota Food Guide;* let me read from it:

> *Drugs and Drug Sundries.*—We are frequently asked about the items in the drug line that are permissible for sale in other than drug stores. We thought it might be well to restate what seems to be the thinking of most of our retailers.
>
> *Drug Sundries*—The toothpastes, toiletries, shampoos, et cetera, are the rapid turnover items in which so much interest is shown and on which so many of our retailers are doing an excellent job. These are the items that are highly recommended for food store sale.
>
> *Drugs* as such should properly be dispensed by qualified technicians. We, as food retailers, are not qualified as pharmacists and, in most cases, readily concede that we are not interested in dispensing drugs. True, there are two or three items which develop a fair volume for which some of our people do have some requests—aspirins, cough syrup, and the like. Perhaps it may seem unimportant to make an issue of these comparatively minor items, but the line must be drawn somewhere, and under the law, such things cannot be sold in a food store. It seems to be the consensus of opinion that as food folks, our sole interest lies in the sale of sundries not drugs. This adds up from a profit standpoint as well.

Fourth, the author of the Bill, Jack Peterson, is interested in passing it. Last week at the hearing before this Committee, he made the statement, "I carried around in my pocket freak bottles of medicine. I do have two bottles of medicine with me this morning. One is labeled cough syrup, the other is labeled vitamins." The Supreme Court in Culver vs. Nelson established that "vitamins" was drug and medicine and not a harmless non-habit-forming proprietary medicine. The label also shows that these medicines are distributed by Pioneer Tea Company of Duluth. Jack N. Peterson is president of the Pioneer Tea Company. May I state that our pharmacy law provides that anyone who sells

drugs and medicines without a license is guilty of a crime. I am also informed by the pharmacy board that neither Pioneer Tea Company nor Jack N. Peterson is licensed to sell drugs and medicines.

Their principal propaganda and statements to the public are that they are interested only in selling harmless home remedies, cosmetics and beauty aids, and not in selling drugs and medicines and that public health is not involved. It is not necessary to amend the pharmacy law in order for them to do what their propaganda claims they want to do. The pharmacy law, among other things, imposes upon the pharmacy board the powers and duties to (1) regulate the practice of pharmacy; (2) to regulate the sale of drugs, medicines, chemicals and poisons, has this proviso:

> Nothing in this chapter shall apply to or interfere with the manufacture, wholesaling, vending, or retailing of non-habit-forming harmless proprietary medicines when labeled in accordance with the requirements of the state or federal food and drug act; nor to the manufacture, wholesaling, vending, or retailing of flavoring extracts, toilet articles, cosmetics, perfumes, spices, and other commonly used household articles of a chemical nature, for use for non-medicinal purposes.

It must be noted that by this act the pharmacy board cannot in any way interfere with any sale of non-habit-forming, harmless proprietary medicines. You will also observe that in order to clarify, some other items (which the drug stores practically exclusively used to sell) come under this exemption as clarification. It provides "nor to the manufacture, wholesaling, vending, or retailing of flavoring extracts, toilet articles, cosmetics, perfumes, spices, and other commonly used household articles of a chemical nature, for use for non-medicinal purposes."

And yet, the propaganda sheets of the Affiliated Merchants Association indicate and lead people to believe that the pharmacy board and drug stores are trying to deprive grocery stores from selling toothpaste, cosmetics, perfumes and other beauty aids. However, their real purpose in passing this Bill is to be permitted to sell drugs and medicines irrespective of whether or not they are non-habit-forming, harmless proprietary medicines and with immunity from liability and without concern to public health. Profits and financial gains are their only motives.

At the hearing before this Committee last week, there was displayed a large cardboard with the name of about eighteen drugs and medicines the author of the Bill claimed were among the drugs and medicines they wanted to sell as harmless non-habit-forming home remedies. Let me give you a brief history of facts relating to court actions involving these drugs and medicines. The pharmacy board with the endorsement of the pharmaceutical association, adopted rules and regulations which prohibited the sale of drugs and medicines by self-service method, and prohibited the sale of any drugs and medicines to any customer of any package to which such customer might have helped himself. Certain drug store chains refused to comply. In the interest of public health, the pharmacy board refused to renew their annual licenses. Two of these firms brought action in District Court of Ramsey County to compel the issuance of licenses and to permit them to sell drugs and medicines by the method of self-service. The pharmaceutical association intervened and I, as its attorney, took part in the proceedings. After taking depositions, the chain stores moved for summary judgment which the court denied. Then these two drug store chains were joined with a third drug store chain and commenced an action in Federal Court in an endeavor to accomplish the same thing. From an adverse decision to them, they appealed to the Court of Appeals at St. Louis and were again defeated. They then agreed to comply with the rules and regulations of the pharmacy law, revamped their stores and removed drugs and medicines from self-service and their licenses were renewed. Then the State of Minnesota, in behalf of the pharmacy board, commenced an action against the Red Owl Stores, Inc., which were selling drugs and medicines at both wholesale and retail in their own stores and to a large number of associate stores, in direct defiance of the request of the pharmacy board to desist, and without complying with any of the provisions of the pharmacy law. The Minnesota State Pharmaceutical Association was permitted to intervene.

Action was also commenced against Groves-Kelco, wholesale house, who was selling these drugs and medicines to the retail stores for resale in violation of law. Defendants answered denying they were selling drugs and medicines and if the items were drugs and medicines they were harmless non-habit-forming proprietary medicines and were exempted from the pharmacy law. They also claimed other defenses on constitutional grounds. In preparation for trial, the plaintiffs took the deposition of Dr. T. B. Magath of Mayo

Clinic at Rochester, Minnesota. Dr. Magath is recognized as an outstanding authority in medicine and pharmacology, and will address your Committee at this hearing. The defendants were represented by several lawyers and also by one known as Dr. Condon from Miles Laboratories. It was, of course, necessary for plaintiffs to prove that these items were drugs and medicines. Dr. Magath first was questioned and testified as to Alka Seltzer. He was cross-examined by the defense lawyers coached by Dr. Condon of Miles Laboratories. After the completion of the testimony on the subject of Alka Seltzer, the defendants asked for a recess. The defense lawyers had a conference and then stipulated into the records that all the eighteen items were drugs and medicines. Since Dr. Magath was leaving for Europe and unable to be present at the trial, we proceeded to question him as to whether or not these eighteen items of drugs and medicines were harmless. Dr. Magath testified that none of the eighteen drugs and medicines were harmless. We then questioned him on whether or not they were non-habit-forming. He testified that six of the eighteen were non-habit-forming, but the others were not non-habit-forming. In other words, they were habit-forming. He also testified that none of the eighteen drugs and medicines were proprietary medicines. At the time of trial, it was stipulated into the records that the eighteen items involved were drugs and medicines; that defendants had not complied with the requirements of the pharmacy law entitling them to be authorized to sell drugs and medicines; it was also stipulated that six of the drugs and medicines were non-habit-forming.

The defendants raised the issue that the pharmacy law contained no provision for injunctive relief but contained a criminal provision for violation of the law and, therefore, the only remedy available was criminal prosecution and trial by jury. The court denied defendants' request for trial by jury upon the grounds that public health was involved and the court had the power and authority to grant injunctive relief. The court further determined that the defendants had the burden of going forward with the proof that the drugs and medicines were harmless non-habit-forming proprietary medicines. At the trial, the eighteen items of drugs and medicines, together with the labels thereon, were introduced in evidence. Evidence was also introduced showing a continuous widespread sale of these drugs and medicines in defiance of law. Plaintiffs rested. Defendants failed to introduce any testimony in support of their defense that the drugs were harmless non-habit-forming proprietary medicines. The lower court found for defendants and held that (1) plaintiffs were not entitled to injunctive relief on the grounds that the pharmacy law had no provisions for injunctive relief, (2) that the only available proceeding was prosecution under the penal provision and trial by jury, (3) also held, in effect, that the defendants did not have the burden of going forward with the proof that the drugs were harmless non-habit-forming proprietary medicines.

Plaintiffs appealed to the Supreme Court. State of Minnesota vs. Red Owl Stores, Inc., and Groves-Kelco, 92 NW 2d, 103. The Supreme Court reversed the lower court and held (1) that the burden of proof to show that the drugs and medicines were non-habit-forming, harmless proprietary medicines rested on the defendants; (2) that this involved public health and welfare and therefore no provision in the law for injunctive relief was necessary to grant injunctive relief; (3) that plaintiffs had established a prima facie case and were entitled to injunctive relief; (4) that with respect to whether or not public health is involved, (a) "the uncontrolled sale of drugs and medicines in inimical to public health; (b) it must be conceded that the subject of public health is deeply involved with the sale of all drugs;" (5) that whether or not it was proper to proceed with an action to stop unlicensed stores from selling these drugs and medicines, "We think that under the circumstances it was the duty of the Attorney General, as agent of the state, to institute injunctive proceedings to accomplish that purpose;" (6) that a new trial should be granted.

The court set February 7, 1959, as the date for retrial of the case. Defendants, upon motion, asked for a continuance until after the legislative session on the grounds that the president of Red Owl Stores, Inc., had been elected a member of the State Senate and the case was reset for trial May 6, 1959. In the retrial of the case, the defendants are afforded an opportunity to come into court and offer proof, if they can, that these drugs and medicines are harmless non-habit-forming, proprietary medicines. If the defendants are successful in proving that any one or all of these drugs are harmless non-habit-forming, proprietary medicines, then any and all such items so-proved will be

exempt and may be sold without control of the pharmacy board. In this manner, the decision of the court will be based upon the evidence produced concerning each drug and medicine. Doctors, pharmacologists, chemists, pharmacists, and any qualified person will be available to testify as to the ingredients, the purpose of the drug, the effects upon the human system and as to whether or not these drugs are or are not harmless non-habit-forming, proprietary medicines. When so-determined by the court, it will settle the issue in a proper proceeding according to law.

Why should the Legislature, without the benefit of expert testimony on each and every drug item, arbitrarily determine and declare that these eighteen drugs and medicines, including thousands of other drugs and medicines, are non-habit-forming, harmless proprietary medicines. A reading of the Bill indicates three things that determine drugs and medicines to be harmless, non-habit-forming proprietary medicines: All non-prescription medicines (1) which are safe when used according to the directions upon, or accompanying, the package or bottle (Both non-prescription and prescription drugs, including strychnine, technically qualify under this part of the Bill); (2) which are advertised or sold directly to the general public under the trade name or registered trade mark of the manufacturer or distributor (There isn't anything in this part of the Bill that can possibly determine or make the drugs and medicines harmless non-habit-forming); (3) and specifically including items that have been designated by the board for sale in stores registered under the provision of Section 151.26. This refers to drugs and medicines which are not exempted in the present law as harmless, non-habit-forming drugs and medicines and by this part of the definition, it changes the drugs to harmless, non-habit-forming by the board designating them for sale in licensed stores according to law. The proponent's statements that these eighteen drugs and medicines are harmless, non-habit-forming home remedies and that no proof has been made that they are harmful, is a false statement and briefly I shall submit some of the proof. The Supreme Court in State vs. Zotalis, 172 Minn. 132, determined that aspirin was not a harmless non-habit-forming drug and medicine.

I also want to call your attention to *U. S. Vital Statistics of 1950:* "aspirin poisoning ranks next to barbiturates and petroleum products poisoning." Also the report of Jerome Trichter, Assistant Commissioner of the New York City Health Department, before New York State Joint Legislative Committee on September 20, 1956 said:

> In New York City from January 1956, through September 1956, there were 3,356 cases of poisoning reported to the City Health Department from household drugs and chemicals. Of these 3,356 cases, 1,552 cases occurred in children under fifteen. Even such a common drug as aspirin . . . accounted for 364 cases of poisoning reported in this nine-month period to the Health Department. Of these 364 cases of poisoning, 278 were in children under fifteen and the balance of eighty-six were in adults . . . this group of cases included four deaths, two in adults and two in children.

How about Bromo Seltzer? In the Red Owl case, the Supreme Court called attention to the label containing the following caution:

> Do not exceed two doses in twenty-four hours. In persistent or frequent headaches, Upset Stomach or Neuralgia, consult your physician. Not for use by children; if rash, drowsiness in daytime, or any unusual symptoms occur, discontinue use at once. Not for use by those having kidney or other organic disease, unless advised by physician. Do not exceed recommended dosage; overly frequent and continuous use may result in serious effects.

From this label, it appears that this drug is so harmful and dangerous that it must not be used by children, which of course includes teen-agers. Anyone having kidney or other organic disease apparently should not use it unless prescribed by a physician. Overly frequent and continuous use may result in serious effect.

These are the type of drugs and medicines that this Bill proposes to declare, by law, as harmless non-habit-forming proprietary drugs and medicines. If these drugs and medicines are harmless non-habit-forming proprietary, then why don't the manufacturers so state upon the label. It is quite apparent that the manufacturers know that such a statement would be false, otherwise it would be so-stated on the label. Instead, the proponents ask the Legislature to falsely declare, by law, that these drugs and medicines are harmless, non-habit-forming, proprietary medicines in order that the same may be sold by supermarket chain stores, grocery stores, restaurants, taverns, filling stations, by peddlers and vending machines, or by anyone at any time and at any place without control or regulation of the pharmacy board or anyone else and without any regard for public health.

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Childbirth After Pneumonectomy

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Presented before the Minneapolis Society of Internal Medicine, January 21, 1959.

SINCE pulmonary surgery has been applied in chest diseases, a number of young women in the child-bearing years have been rescued from their illnesses and returned to their families with only one lung remaining. The question of their ability to bear children arises and should be answered as wisely and clearly as possible. Much of the rehabilitation of the chest patient depends upon regaining self-confidence, and in the young woman, much of it will revolve around her ability to raise a family. We have seen two patients complete two pregnancies sucessfully after total pneumonectomy.

Review of the literature shows records of ninety-seven women successfully delivering 117 children after pneumonectomy. The first of these patients was reported in 1950.[1] In 1953,[2] twelve more were reported; in 1954,[3] an additional four. Laros[4] in his study of all the cases in the Netherlands, reported in 1958 on sixty-four women who had a total of seventy-four children after pneumonectomy. This seems to be the total experience recorded. In all, there were ten fetal deaths and no maternal deaths.

Report of Cases

Our *first patient* had her right middle lobe and right lower lobe removed because of bronchiectasis in 1940. Continuing productive cough and hemorrhage led to removal of the remainder of the right lung in October 1944. Marked herniation of the left lung through the superior mediastinum into the right chest cavity followed the procedures. She had symptoms of precordial pain, dyspnea, and numbness in the left arm for about a year. Lasting longer were symptoms of obstruction to swallowing. This was shown by barium examination of the esophagus by fluoroscope and x-ray films to result from a constriction at the level of the clavicle. The mediastinum was found shifted into the right chest, with the esophagus to the right of the trachea and dilated above the constriction. The question of right thoracoplasty was entertained in order to relieve these symptoms of traction, but this never was carried out.

In April 1946, the patient was found to be pregnant. She was twenty-nine years old, her vital capacity was 2200 cc. in four seconds, 1900 cc. in 2.4 seconds, and her general condition seemed improved. Her life was not felt to be threatened by the pregnancy and she was followed closely. Two previous pregnancies had terminated with normal deliveries and the third one was completed equally uneventfully. There was no rise in her normal venous pressure and breathing capacity was unchanged. A coincidence during this pregnancy after pneumonectomy was total relief from all symptoms related to her shifted mediastinum. She has had three attacks of pneumonia in the left lower lobe during the past twelve years, but no other major illnesses.

Our *second patient* was first seen when she was twenty years old in 1949. She also presented a long history of bronchiectasis which probably started in her infancy. At age seventeen she had the left lower lobe removed, and a year later, the lingula. Despite this, she continued to have fever bouts when first seen, with temperatures of 101° to 104° occurring one or two days a week. Such episodes were associated with increased amounts of sputum which otherwise measured two ounces or less each day. When she was febrile, her sputum was foul; it always was purulent and highly tenacious with a gelatinous consistency. At her initial examination, a loud second pulmonic heart sound was noted and a presystolic apical crescendo murmur. A small non-toxic goiter was present, and coarse, shifting rhonchi were always heard over the remaining lung tissue. It was feared that her pulmonary venous pressure was high and that she might tolerate further surgery poorly.

After a month of observation she had the remaining portion of the left lung removed and an extensive thoracoplasty. For the first two months after this she was

well, but then she began to raise more sputum than before, and again had bouts of fever. Penicillin therapy provided only one week of relief; nevertheless, it was continued. The penicillin did alter the color of the sputum from green to yellow, but the amount remained more than two ounces daily. Re-examination now revealed about the same findings on the right, with the addition of some retraction of the interspaces on inspiration. Bronchoscopy showed the trachea to be flattened in the antero-posterior direction, apparently due to the softening of the cartilages.

Another intrathoracic procedure was undertaken to try and increase the tracheal lumen and stabilize it. Bronchoscopy several months later showed no great change. Terramycin was started in 1950 and was continued, but the patient continued to have much respiratory distress with cough, clear sputum, and dyspnea at rest. Her vital capacity increased from 1.5 l. (liters) to 1.8 l. in the first year after the tracheal stabilization. Postural drainage was prescribed but never well carried out. Tracheal aspiration was done twice a week for the next several years. She tended to take the Terramycin fairly continuously but was limited by the diarrhea it produced. Her usual schedule was 1 gm. per day, four days a week. There was an episode of enlargement of the liver which was thought to be due to congestive heart failure.

In 1952, because of physical signs and the already high metabolism, thyrotoxicosis was diagnosed and treated with propylthiouracil. She had had constant tachycardia, which had increased, and her weight had fallen to an all-time low. The results of therapy were good enough so it was continued for two years.

While taking Terramycin she developed a mastoiditis which had to be treated surgically. The infecting organisms were resistant to antibiotics. She had repeated attacks of purulent sinusitis, some of which responded to sulfonamide therapy. Because she had used Terramycin steadily for four years, three or four days every week, it was withdrawn—not without considerable protest from the patient. In late 1954, the propylthiouracil was also stopped.

The diagnoses at this point were: absent left lung, bronchiectasis and emphysema of the right lung, mitral stenosis, chronic pansinusitis, hay fever, asthma and migraine. She had gone through two periods of moderate depression during observation. The hay fever and asthma had been difficult to diagnose in the presence of so much suppurative disease. Nevertheless, desensitization therapy was begun, and as it was continued, it was evident that there were fewer episodes of infection. As one might presume, as the allergic state of the respiratory mucosa was reduced, there was less secretion of thick mucus and, in turn, less bronchial and sinus ostium plugging and obstruction. The tracheal aspirations gradually were eliminated after having been done twice a week for five years. She had no respiratory infection in 1955 requiring therapy.

In May, 1956, she married. In April 1957, she became pregnant and after consultation it was agreed that she seemed well enough to survive the pregnancy, if elaborate precautions were taken to protect her against pulmonary and cardiac overload. Her vital capacity was found now to be 2.0 liters. Her weight at the beginning of pregnancy was 118 lbs, some 15 lbs. more than it was with the thyrotoxicosis. At delivery, her vital capacity remained 2.0 l., her weight reached 138 lbs. and in the last trimester her pulse rose to 120 when taken in the resting state. Her resting respiratory rate (seated) was 20 to 24 per minute. There were no other signs of pulmonary or cardiac distress, even at the theoretical time of peak load and maximum blood volume at seven months gestation.

Delivery was accomplished by Cesarean section in December 1957, at thirty-six weeks of gestation, without difficulty, under local anesthesia. Pentothal (a few cc.) was given to make her sleep during the extraction of the baby; and she awakened before the skin was closed and was out of bed the next day. No curare was permitted.

During the past year she has had another attack of sinusitis and otitis which cleared up in four weeks under treatment with penicillin and sulfadiazine. Beta hemolytic streptococci were cultured from the throat at the onset. She continues desensitization therapy and has only minor asthma and hay fever.

Summary

Ninety-seven women have been reported in the literature as having borne 117 babies after total pneumonectomy. Two more successful cases are reported, one with complicating mitral stenosis, asthma and emphysema. Probably many times as many deliveries have occurred as have been reported. Pregnancy and delivery are accomplished successfully in these women—usually *via* a low forceps delivery after normal labor. In our second case, operative delivery seemed required because of impending cardiorespiratory decompensation. Very few operative deliveries are reported to be required. After observing these patients, we feel reinforced in the belief that pregnancy and delivery are such normal events that they usually can be tolerated even by a woman with only one lung. The reproductive careers of such women should be determined by their prospects of living to raise the children they bear.

References

1. Long, J. H., Wesher, M. R., Willson, J. R., and Rosemond, J. P.: Studies in pregnancy following pneumonectomy. J.A.M.A., 143:358 (May 27) 1950.
2. Folsome, C. E., and Kuntze, C. D.: Pregnancy following major surgery for tuberculosis. Am. J. Obst. & Gynec., 65:1319, 1953.
3. Corner, G. W., Jr., and Nesbitt, R. E. L.: Pregnancy and pulmonary resection. Am. J. Obst. & Gynec., 68:903 (Sept.) 1954.
4. Laros, C. D.: Pregnancy after pneumonectomy for pulmonary tuberculosis. Am. Rev. Tuberc., 78:562-569 (Oct.) 1958.

Editorials

JOHN F. BRIGGS, M.D.
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ANTIHYPERTENSIVE AGENTS

II. Five Commandments for Proper Use

The following commandments, if diligently practiced, will help prevent commonly committed sins in the use of antihypertensive agents.

1. Thou Shalt Evaluate Thy Patient Before Treatment Is Started

Every patient who is a candidate for antihypertensive therapy deserves careful study to (1) rule out causes for secondary hypertension, such as pheochromocytoma, coarctation of the aorta, aldosteronism, Cushing's syndrome and unilateral renal disease, (2) evaluate the status of the cardiovascular and renal systems and (3) establish pretreatment levels of blood pressure. When these fundamental rules are ignored, pheochromocytomas may go unrecognized, potentially curable hypertension is not discerned, and injudicious use of potent drugs may aggravate coronary, cerebrovascular or renal insufficiency.

One or two casual determinations of blood pressure in the physician's office can be extremely misleading with respect to the severity of hypertension. If it is impractical to measure the resting blood pressure, either in the hospital or at home, numerous readings should be made in the office on several different days, preferably by a nurse or a technician. An obvious exception to this deliberate method of evaluation occurs in severe hypertension (group 3 or 4) with impending complications, in which delay of therapy is neither necessary nor advisable.

2. Thou Shalt Treat Thy Patient With All Thy Might and All Thy Skill

Once the decision in favor of medical treatment has been made, the treatment should be pursued until the blood pressure is brought under satisfactory control or until the patient cannot tolerate effective doses of the medicaments, no matter how artfully they are combined. Insofar as is presently known, no virtue is to be derived from ineffective doses of hypotensive drugs. If the blood pressure is not reduced, treatment is a failure and should be appropriately modified or abandoned. The immediate goal of treatment is normotension or as near to it as the patient and his cardiovascular and renal systems can safely tolerate.

3. Thou Shalt Not Abandon Effective Therapy

Despite the rapid advances made in the field of antihypertensive therapy in the past ten years, clinicians still do not have a drug that cures hypertension. This means that medication must be continued indefinitely if the blood pressure is to be controlled. It is a grievous but unfortunately common error in the treatment of hypertension to discontinue medication when the blood pressure becomes normal, for almost inevitably it will increase again when medication is withdrawn.

4. Thou Shalt Not Become Encumbered by Combination Tablets

Although combinations of drugs frequently are employed for adequate control of hypertension, the use of single tablets that contain combinations of drugs is to be deprecated, for this deprives the physician of his ability to make precise adjustments in the dose of one agent without simultaneously changing that of others. Pharmaceutical houses are adding to the understandable confusion in the field of hypotensive drugs by glutting the market with tablets containing two or more ingredients and bearing proprietary names that often conceal this fact and that have no intelligible significance insofar as the drugs contained therein are concerned. I refer to such anomalies in nomenclature as "diupres," which contains diuril and reserpine (not apresoline, as might be anticipated from the name), and "mio-pressin," which contains phenoxybenzamine hydrochloride (dibenzyline), protoveratrine and the whole root of Rauwolfia (who would have guessed?); other examples are protalba-R, unitensen-R, veralba-R, elserpine-prab, rauprote and rauvera, which are a few trade names of preparations that contain a combination of derivatives of Veratrum and Rauwolfia. Is it any wonder that patients sometimes receive derivatives of Rauwolfia in several different tablets taken simultaneously and innocently prescribed by a busy practitioner who cannot decipher the jargon of polypharmacy?

Drug companies rationalize this situation by declaring that it is cheaper for the patient to take

his medicine combined in a single tablet. This is true only for the occasional patient whose hypertension fortuitously is controlled best by therapy with drugs in the exact proportion contained in a single tablet. However, just as most men can be fitted best with clothes that are custom-tailored, so most hypertensive patients fare better if their regimen is tailored individually by an attentive physician and not fashioned wholesale by a remote drug house. In such cases, the economy of combination tablets is false, because, when the dose of one ingredient is optimal, the dose of the other is necessarily either inadequate or excessive. These discrepancies are compounded when tablets contain three different drugs. Manufacturers of drugs and some physicians fail to realize that the therapeutic requirements of hypertensive patients may change from time to time, with regard to both the type of drugs and the proportions of their doses. Combination tablets fail to meet this changing need.

In my opinion, the only legitimate indication for using such tablets is for the patient who has an aversion to taking medicine and who reckons dosage in terms of the number of tablets consumed rather than their contents. In such cases, one is justified in trying to get in as much medicine per tablet as is possible.

The physician should not forfeit to drug companies his right to adjust the doses of the drugs precisely and to individualize regimens.

5. Thou Shalt Follow the Hypertensive Patient as Long as Ye Both Shall Live

Although it may be debatable that all hypertensive patients should be treated, there can be no argument that all such patients do deserve careful medical attention and observation. The physician must assume the responsibility for close surveillance of those patients to whom he denies specific hypotensive therapy so that progression of the disease can be recognized and appropriate treatment instituted before irreversible complications develop.

Effective treatment with hypotensive drugs demands frequent observation and regular determination of the blood pressure. Weekly, if not daily, visits will be necessary at first until a satisfactory regimen is constructed. Thereafter, it is advisable to see the patient who is taking antihypertensive drugs at least once a month. In this way, one can be assured that the hypertension is remaining under good control, that appropriate adjustments in dosage can be made, and that late side effects can be detected before serious harm results. Constant and sympathetic attention from a solicitious physician may prevent a disgruntled and unhappy patient from abandoning effective therapy because of annoying side effects.

The unreasonable and illogical prejudice that some physicians hold against the determination of blood pressure at home is frequently a disservice to the patient. A successful antihypertensive regimen in this enlightened age depends to a large extent on taking the patient into partnership in the endeavor. In this cooperative effort, the patient is entitled to know his blood pressure, whether it be taken in the physician's office or at home. Most patients whose hypertension is severe enough to require the use of ganglion-blocking agents doubtlessly will fare better if they take their own blood pressure at home and are taught to adjust their doses of medicaments according to these readings. Except in rare cases, this does not lead to anxiety and obsessions as claimed by some physicians; to the contrary, it allays anxiety when the patient sees his blood pressure coming down and he realizes that his hypertension can be treated effectively. Opposition to the measurement of blood pressure at home frequently arises from the physician's anxiety (not the patient's) about his ability to treat hypertension satisfactorily.

L'Envoi

These, then, are the commandments for proper use of antihypertensive agents. Ignore them, and thou shalt surely fail; keep them, and the numbers of thy grateful hypertensive patients shall surely increase.

RAY W. GIFFORD, JR., M.D.

MEDICINE'S GREAT NEED

A Little Bit of Empathy

Empathy—"the entering into the feelings of another person"—is a word which has been brought to the attention of physicians in the past few years. Recent teachings have exhorted physicians to avoid the use of empathy in their practice of medicine, stating in effect that the patient must be treated objectively and as a physiologic whole. The physician must remain aloof from the sharing of any of his patients' emotional situations, stresses and problems. Without a doubt such a thesis is by

far the more comfortable way to practice medicine, but where is it leading us?

Today, we physicians in America are fast becoming an isolated group surrounded by an ever-increasing tide of socialized medicine. Yet, throughout the world, the adherents to the socialization of medicine among the medical profession itself will often admit that the life of a socialized physician is an easier one certainly than that which they had previously led. The association with the patient is much more objective and in most instances hours of work are prescribed. In many of the larger clinics in the larger cities, the patient has no attachment to any one physician, but is required to accept whoever is available at the hour at which he arrives. All fees and charges are set by law or regulation so the physician is devoid of any financial concern. In talking with a Swedish physician not long ago, I realized that as one rises higher in this hierarchy of socialized medicine this disassociation from the patient becomes even greater. The higher specialist chooses only those patients whom he wishes to see, not necessarily those who wish to see him.

What then is driving the patient to support socialized medicine? Does not much of the blame stem from our own actions, wherein we, as free practicing physicians, are setting up, in effect, the conditions under which socialized medicine thrives: namely by strictly limiting our hours of practice especially in the specialties; by adhering too strictly to rigid fee schedules; and by giving less of ourselves to our patients. Today, there is not a specialty group in any local medical society that does not have its own relative-value fee schedule, which, in itself, is a justifiable document very necessary for the protection of the individual physician against those large interests who would be willing to take an unfair advantage of the private physician. However, I was appaled, when attending one of the committee meetings of our local medical society, with the number of petty patient-physician grievances over charges, some involving no more than $2.00. In each instance, the physician was entirely within his rights according to the adopted relative-value fee schedule of that particular specialty society. However, when it is held up as an unbending yardstick against the individual patient, that individual will soon be lost to the cause of private medicine, especially if that physician is equally unbending in his willingness to see the patient during any but very prescribed hours.

Today, the number of private practicing physicians who are willing to make house calls is steadily decreasing. Physicians are demanding their free time, uninterrupted, without adequate considerations of the feelings of the patient, whether the patient be physically sick or emotionally ill. All of this stems from the philosophy of regarding our patients on a purely objective basis and as a physiologic whole. This, of course, is scientifically adequate, but with it we are overlooking one major premise; to wit, we are dealing with our fellow human beings. They have emotions and problems which must be shared to some extent by the physician, that person in whom they place their confidence. They must be assured of his continued interest and that he is not just someone who will see them one day and then pass them on to another physician the next day.

Less than two centuries ago our country was established after a long and bitter struggle on just such principles of free enterprise and the rights of the individual. Now, from without our own boundaries, these rights and liberties are being insidiously attacked from every angle. As physicians, the socialization of the practice of medicine is our concern. We are not going to maintain these rights and privileges unless we can convince the public at large that this is the better thing for them and can give the public the type of medical service they desire not merely the type of medical practice we might wish for them. Any enterprise worth its salt is worthy of the effort that goes into it, and we, as private physicians, are going to have to put forth that effort to maintain our status of private enterprise. We cannot look askance at satisfying our patients. We must be willing to see and treat our patients cheerfully during their illnesses. We must be able to individualize and evaluate the financial abilities of our patients and not allow our relative-value fee schedule become our hard and fixed rule. We must have a sympathetic feeling for each and every patient and attempt to understand his needs and problems. In short, we must have a bit of empathy.

L. Clagett Beck, M.D.

THE GHOST INTERNIST

A few years past the ghost surgeon was a popular point of discussion. He was the individual who through prior arrangement with his associates entered the operating room and performed surgery without the patient's awareness of his existence. The attending physician then left his patient with

the impression that he had been the surgeon in charge of the case. The attending physician either paid the ghost surgeon directly or some "under the table" method of remuneration had been arranged. Fortunately, these few individuals have been eradicated. It was recognized by the medical profession that these individuals served no useful purpose either professionally or personally to either the patient or the attending physician.

Unfortunately, the ghost internist "still exists." He is usually a resident in training or in some instances even an intern who may profess an interest in Internal Medicine. Certain of the attending staff physicians in the Hospital, under the guise of assisting the young physician, turn over to him their medical cases for diagnosis and management. The training of these young men and young women must be under the jurisdiction and personal supervision of people qualified in Internal Medicine. Unfortunately, the "ghosting" is usually done by people unqualified in Internal Medicine. It is simply a means by which they obtain "a complete medical work-up" and special care for their patient from the house staff.

There is no complaint relative to the complete study and care of a patient by the resident or intern as long as it is supervised by a qualified person. It is strictly dishonest and it serves no useful purpose to either the patient or the attending physician if such a study is not supervised by a trained internist. It is the implicit responsibility of the Intern Resident Committees to be certain that the resident and intern is not being prostituted by staff men who follow this custom. Since "ghosting" in Surgery served no useful purpose and was recognized as contrary to the best philosophy of the care of the patient so "ghosting" in Internal Medicine serves no useful purpose and should be abolished.

J.F.B.

SOCIAL SERVICE

Medical Report

The patient, D. M., was admitted to the University Hospitals on September 7, 1954. He had been in an automobile accident on April 18, 1954 and sustained a compression of the body of T12 with dislocation of T11 on T12 with resultant complete motor and sensory loss of both lower extremities and transverse fractures of the mid-shaft of the right tibia and fibula. He was taken to Municipal Hospital in Long Prairie, where he was treated by trunk sling suspension and leg traction followed by application of a cast to the right leg. He remained incontinent of urine and feces.

The patient was discharged to his home in a wheel chair on July 20, 1954. Here he sat for a whole week because his mother said she had no bed for him and was afraid to move him. He was readmitted to the Municipal Hospital on July 28, 1954, with a recurrent urinary tract infection and a sacral decubitus ulcer. Another ulcer over the left great trochanter developed shortly afterward.

Previously, on June 29, 1954, the patient's local physician had requested transfer to the Neurosurgery Service of the University Hospitals through the Todd County Welfare Board. Apparently because of the length of time which had elapsed since the patient's injury, surgical intervention was not indicated. Consequently the patient was placed on the waiting list on July 28, 1954, for a bed on the Physical Medicine and Rehabilitation Service and was transferred September 7, 1954, from the Municipal Hospital in Long Prairie.

Physical examination revealed a seventeen-year-old boy with a complete paraplegia. There was a sensory and motor level at T12. The patient was incontinent of urine and feces. There was a large infected sacral decubitus ulcer about 10 centimeters in diameter and 2 to 3 centimeters deep. Another pressure area 1 by 4 centimeters overlay the left greater trochanter. There was a gibbus deformity of the spine at T12 and the right leg was in a posterior plaster splint. Both ankles and feet were moderately edematous. The lower extremity musculature was moderately atrophic. There was bilateral drop foot and tightness of the left gastrocnemius muscle. Abdominal reflexes were absent in the left upper and lower quadrants. Knee jerks were hypoactive bilaterally as was the left ankle jerk. The right could not be tested.

The hemoglobin was 14 grams per cent, the white count was 16,000 with 76 per cent neutrophils and total serum protein was 7.2 mg. per cent with an A:G ratio of 3.1 to 4.1. The urine contained red cells, white cells, albumin and numerous bacteria which on culture were Aerobacter aerogenes and a Proteus species.

X-ray examination revealed an old compression fracture of T12 with anterior subluxation of T11 on T12, and a healing fracture of the mid-shaft of the right tibia and fibula. There was diffuse osteoporosis of the pelvis and bones of the lower extremities. An intravenous pyelogram demonstrated a urinary tract which appeared normal. Cysto-

scopy and cystometry revealed a spastic neurogenic bladder with a capacity of 200 centimeters.

The patient's rehabilitation program was necessarily delayed because of the sacral decubitus ulcer and subsequent surgical procedures, recurrent thrombophlebitis, and intermittent flare-up of the chronic urinary tract infection. Nevertheless, three days after admission he was getting range of motion activity in bed as well as resistance exercise to the upper extremities while lying prone. This bed program continued until November when he was brought up to physical therapy for treatment in the Hubbard tank and ultraviolet irradiation for his decubiti. Exercise for the upper extremities was carried out prone on a litter. In January, 1955, the patient began weight bearing on the tilt table with his legs wrapped in tensor bandages. By February he was allowed to sit in a wheelchair. In April he began standing in the parallel bars and in May he began walking on crutches and long leg braces. In July he no longer used his wheel chair and was climbing stairs. His proficiency in transfer activities was good.

The orthopedics staff was consulted on September 22 and thought weight bearing with a long leg brace on the right leg was permissible.

The plastic surgery staff was consulted and subsequently on October 18 the sacral decubitus ulcer was excised and the defect was closed by a comma flap. A split thickness graft was applied after partial break-down on December 7. The area was treated conservatively with Hubbard tank therapy, mercurochrome and ultraviolet irradiation and was finally healed in May, 1955.

After consultation with the urology staff, straight catheter drainage and intermittent catheter clamping was instituted. By May, 1955, the patient could tolerate catheter clamping for three to four hours. In June the catheter was removed and the patient was emptying his bladder every three to four hours with the aid of a suprapubic pressure. Occasional dribbling incontinence was controlled by ABD pads placed about the genitalia. The patient was given Gantrisin 0.5 gm. four times a day to inhibit flare-ups of the chronic urinary tract infection and Basaljel 30 cc. four times a day to prevent the formation of urinary tract calculi.

Occupational therapy designed to increase strength of the upper extremities was also instituted early.

The patient was often apathetic and lackadaisical in the carrying out of his program. He was depressed from time to time and had to be cajoled and coaxed. His lack of maturity was obviously a factor.

At the time of discharge on October 3, 1955, the patient was completely independent in his activities of daily living. He could manage his personal hygiene needs, transfer in and out of bed, get in and out of car and get up to a standing position from the floor. Ambulation with crutches and long leg braces using a four point gait could be maintained for at least twenty minutes at a time. However, he was afraid to get in and out of a bus unaided or to get up and down curbs. Bowel and bladder control were good. Discharge orders included Gantrisin, Basaljel, and a urinal bag.

The patient was readmitted on October 5. Because of improper use of the urinal bag the venous circulation had been obstructed with resultant edema and abrasions of the genitalia. He was treated with ice packs to the genitalia, ultraviolet irradiation for the abrasions, and antibiotics. This time he was given ABD pads instead of a urinal bag. He was discharged on October 14, 1955, ambulating and independent.

The patient was admitted for the third time on April 10, 1956, for treatment of decubitus ulcers on the right and left thighs. He gave a history of having fallen several times in the ten days before admission. This apparently resulted in injury to the skin beneath the posterior cuff at the proximal end of the long leg braces. The first ulceration was noted approximately ten days prior to admission and subsequently became progressively larger and deeper. He delayed coming to the hospital because he feared he would not be able to continue with his employment.

On examination there was a 9 by 6 centimeter ulcer on the posterolateral aspect of the right thigh which was infected and extended to the fascia. A smaller, more superficial ulcer was present on the posterolateral aspect of the left thigh below the buttock. There was also a small ulcer over the right lateral malleolus.

The ulcers were treated with Neomycin packs, whirlpool and ultra-violet therapy. On April 30, 1956, a secondary closure of the decubitus ulcer on the right thigh was performed. Healing progressed satisfactorily. The patient was discharged on May 18, 1956 and returned to work.

BERNARD SENDLER, M.D.

BEAUTY THAT LASTS FOREVER

The fine white porcelain ware we know as china originated, as the name implies, in the Chinese Empire during the days of the ancient dynasties. In Europe, the secret of making china was discovered anew by the old alchemists, more or less by pure accident, on their eternal search for the way of transmuting common metals into gold. This gave birth to china's other name of "White Gold," a name still used often in trade circles, but more because it so aptly describes the distinctive beauty and value of the prized material.

China's most outstanding attribute is that it does not deteriorate with age. If a modern coffee pot were to be buried in the ground today and left there for our descendants to recover a thousand years from now, it would still look as new as it did on the first day, still be as white, dainty and translucent as ever. Porcelain ware recovered from old merchantmen that have lain at the bottom of the sea for generations and even centuries can be used again for its original purpose after being cleaned of the dirt deposited on it through the years.

Few other materials show such striking qualities. How easily iron begins to rust, how quickly textiles wear out, and how short is the time before wood starts to rot in contrast to china's unlimited durability.

Though so delicate in appearance, porcelain is actually harder than steel. Even the sharpest knife cannot make the slightest trace of a scratch on a piece of hard porcelain baked at a temperature of 2700 degrees.

Furthermore, household china resists the corrosive action of all acids commonly encountered in the home. The juice of a lemon left on a plate or in a cup rinses off without leaving the tiniest stain. Normal earthenware utensils, on the other hand, only too easily become stained if the glaze gets chipped or cracked and no amount of scrubbing and scouring will get rid of the marks.

The history of the material used for chinaware is exciting. The two words "kaolin" and "porcelain" alone embrace a wealth of strange and thrilling happenings. "Ka-o-lin" is Chinese and means a hillside or mountain ridge. On such a ridge several hundred years ago, during the rule of the Sui dynasty, a Chinese shepherd who was tending his flock noticed that a landslide had exposed a layer of whitish clay. He paid no further attention to it until one day he made a fire to keep himself warm in the chill mountain wind and discovered that the heat indelibly baked his footmarks in the soft white mass.

Porcelain derives from the Italian name "porcella" for a fine white seashell and recalls one of the greatest adventures of all time—Marco Polo's journey through the Oriental world. On his return from Mongolia in the year 1295, the daring Venetian traveler introduced to the western world not only the controversial achievement of gunpowder and that less controversial food that was to become an Italian staple, spaghetti, but also the much-admired porcelain and celadon ware of the East. It took more than 400 years before the art of making it became known and practiced in Europe.

In 1702, the grim musketeers of warlike King August of Saxony ordered Johann Friedrich Böttger to find the elusive magic formula for making gold. Instead of solving the haunting mystery of gold making, he became an excellent ceramist. In 1709, after much experimenting, he succeeded in producing a light, exceptionally hard, and translucent-like, material by baking a mixture of kaolin, felspar and quartz. This was the first piece of Dresden china, and to this very day all porcelain is made the same way.

It turned out that Böttger's "new" material was ideal for a whole variety of uses, including of course tableware, and the Saxon monarch soon realized that he had indeed found a way of making gold, although a rather roundabout one. Others were convinced of the fact, too. Madame Pompadour opened a manufactory at Sévres and made a name for the town and good profits for herself. Frederick the Great found a luxurious porcelain service ideally suited to change the Russian Empress's attitude toward Prussia.

Seldom has there been so much fighting, espionage, intrigue, treachery, stealing and suffering on account of any one article as on account of porcelain.

For more than a century, fine chinaware remained reserved for the rich and powerful, until an enterprising young man named Philipp Rosenthal began a two-man business of painting porcelains in a small castle near the German-Czech border; shortly after that he began the manufacture of porcelain. He gradually built a thriving enterprise that distributed its wares over the world,

making the then very rare china available to all. Porcelain bearing the full name of the manufacturer was something new. Philipp Rosenthal was the first to lend his name as a guarantee of the high quality of a particular and distinctive make of china.

ROSENTHAL

DEEP BREATHING IN CORONARY DISEASE

It is a physiological fact that when a person takes a deep chest breath and holds it, negative pressure is produced inside the chest cavity and the pericardium, or heart sac. This fact can be readily demonstrated by testing the chest by the mercury Baumanometer, or blood pressure instrument. Measuring the pericardium or heart sac for negative pressure should be performed only by a specialist. Under normal physiological conditions of the heart sac, the negative pressure as measured by the mercury Baumanometer, records a minus 22 mm of mercury. The two main coronary blood vessels that supply blood to the heart, lie, one on the front surface of the heart, and the other, on the back surface of the heart. How much negative pressure is present inside the coronary blood vessels when the heart sac registers a minus 22 mm of mercury, I do not know. An intriguing experiment for our heart surgeons. But, since these main coronary blood vessels lie on the surface of the heart, it is reasonable to assume that they are also affected by the negative pressure that is present in the heart sac when a deep breath is taken. That the coronary blood vessels are affected by this negative pressure and that it enlarges them, though moderately, I believe, is axiomatic.

When the subject of negative pressure inside the chest, during a deep breath, was studied by our physiology class, a lively discussion with our instructor took place. Many students in our class had had science teaching experience in high school. This time they were students and the physiology professor was the teacher. The professor was patient, cooperative and resourceful. He brought us to a complete understanding of the subject. Had this interesting discussion not taken place, I am sure this physiological fact would have been forgotten by me very shortly. But, some twenty years ago, one of my older brothers passed away suddenly, with a coronary attack. Within another ten years, two more of my brothers died from the same affliction.

The musing on negative pressure inside the heart sac began to take on sober aspect for me, and I began to wonder if there might not be some morsel of help to be gained from this physiological truth of negative pressure inside the heart sac during a deep breath. That the two main coronary blood vessels supplying blood to the heart should expand, at least slightly, under this negative pressure, I felt, should be axiomatic. I checked the physiology textbooks anew. I could find no reference to that effect. Then I checked the medical textbooks for the phenomenon. I reviewed the symposiums on coronary heart disease by specialists conducting these meetings. I did not find any mention of this phase in treating coronary disease—that is, by using deep breathing exercises to aid in expanding the coronary blood vessels. I was not discouraged, but only concluded that the idea had not been considered. Breathing is a normal physiological act, and increasing it to a deep breath, should not add any risk nor danger to the ailing coronary patient. Neither would I classify deep breathing as physical exertion. Any risk involved, I felt, would be purely coincidental.

For over a decade, I have supplemented the treatment of coronary disease with deep breathing exercises. None of the other standard methods of treatment are omitted. As a general practitioner in a rural community, one encounters the average percentage of the various kinds of heart disease. Farmers that are stricken with coronary disease, I encourage to remain on the farm, if possible. I suggest that the patient build a small, but comfortable house to live in, in order that he may continue to enjoy his lifetime environment. Here he will take pleasure in his slowed up tempo of working around the farm at a leisure that he soon learns to live with, and to enjoy. A new environment, irrespective of his ailment, invariably hastens the end.

A coronary patient admitted to the hospital requires at least two to three weeks of rest, combined with the deep breathing exercises and the standard medical treatment. I explain to him what this supplemental, deep breathing exercise is expected to accomplish in conjunction with the standard treatment. I demonstrate for the patient, the manner in which it is performed. Then I have him take over. After he has held his deep breath for possibly eight to ten seconds, he then exhales and inhales three to four times slowly to eliminate the waste material. He then takes a second deep breath

and holds it for eight to ten seconds, followed by three to four breaths to air out the lungs. These deep breathing exercises are repeated in this manner until he has performed them eight to ten times. I suggest that he performs them in a lesiurely manner, in order to prevent over-ventilation of the lungs. I have not observed that these exercises have strained the heart nor patient. I suggest that the patient start these deep breathing exercises as soon as he awakens in the morning, with the last exercise being performed when he retires at night. During the daytime, I advise him to perform them at least ten times at regular intervals. By the time that the patient is dismissed from the hospital the exercise has become routine with him. Some have reported that these exercises are relaxing. Before the patient returns home, he is advised to continue the breathing exercises routinely. Should he, at any time, experience any discomfort in the chest, he is to take a deep breath immediately. Plus this, he is, of course, to use the heart medicine prescribed.

Some six years ago, I removed the gall bladder from an ailing coronary patient, whom I had, for several years, taken care of for his heart condition. It was interesting to learn from him how the deep breathing exercises had helped him to differentiate the gall bladder distress from the heart distress. If it was heart distress, he was relieved by the deep breathing exercises. If it was gall bladder distress, he was not relieved. He was quite insistent upon having the gall bladder removed, in spite of the coronary risk. He made an uneventful surgical recovery.

Last fall, this same retired farmer, living on his farm, in the small, attractive home he had built for himself and his wife, a quarter of a mile from his former home that his son and family now occupy, told me the following story. He was operating the tractor and his son was on the corn picker. The father was seized with a heart attack. He took a deep breath, at the same time he flicked off the ignition key, thus stopping the motor. Being aware of his Dad's heart condition, the son came over to see what was wrong. The father carried out his deep breathing exercise, and after a few deep breaths, he became pain free. He retired from the field for the remainder of the day, but after a couple days of rest, he returned to the tractor, and remained on the job until the corn picking was completed, without any further trouble.

He concluded the story by adding, "It's the most convenient medicine I could possibly carry around with me."

Clinically, as I observe these patients, I am favorably impressed with their progress. I believe that the supplementary deep breathing exercise added to the standard treatment of coronary disease, is very encouraging. Two forces acting in unison to enlarge the lumen of the coronary blood vessels to increase the blood and oxygen supply to the heart muscle, I believe, accounts for this clinical improvement.

As one muses on this phase of coronary disease, one immediately begins to wonder what deep breathing exercises, if practiced daily, might do to prevent coronary disaster. Preventative medicine. The pace of the race is constantly growing more furious, and coronary disease flourishes in the increased tempo. Possibly, adding these exercises to our busy schedule in order to supply more blood and oxygen to the heart, might pay a liberal dividend.

Shakespeare has left us a quotation well worth musing on:

"Our remedies oft in ourselves do lie, which we ascribe to heaven."

JULIUS J. HEIMARK, M.A., M.D.

RECTAL AND SIGMOID COLON NEOPLASMS

(Continued from Page 1058)

11. Mathews, W. R.: Carcinoid tumors of the rectum. Texas J. Med., 53:16 (Jan.) 1957.
12. Mrazek, R. S., Jr., Godwin, M. C., and Mohardt, J.: Carcinoid tumors, clinical and pathological study of 27 cases. Surg. Gynec. & Obst., 96:661 (June) 1953.
13. Ritchie, A. C.: Carcinoid tumors. Am. J. M. Sc., 232:311, 1956.
14. Coller, F. A., and Berry, R. L.: Cancer of the colon. J.A.M.A., 135:1061, 1947.
15. Moynihan, B. G. A.: The surgical treatment of carcinoma of the sigmoid flexure and rectum. Surg. Gynec. & Obst., 6:463, 1908.
16. Miles, W. E. A.: A method of performing abdominoperineal excision for carcinoma of the rectum and terminal portion of the pelvic colon. Lancet, 2:1812, 1908.
17. Sherman, L. F., and Tenner, R. J.: Surgery of the lymphatics in rectal and sigmoid colon cancer. Minnesota Med., 42:697, 1959.
18. Freidin, J.: The lateral spread of carcinoma of the rectum. The Australian and New Zealand J. Surg., 24:283, 1955.

President's Letter

SUDDENLY YOU ARE A GOVERNMENT EMPLOYE

Physicians in Britain were busy tending to the health needs of a nation recovering from the full economic, physical and social impact of World War II.

The day to day activities of the British physicians overshadowed the July 5, 1948, date when the National Health Service Act of 1946 went into effect in England, Scotland and Wales.

Many believed that this was needed to bolster inadequate private health care. Suddenly British physicians found that they were salaried employes of the state. These physicians are now busier than ever before. We are told that the maximum number of patients which a British physician can carry on his panel is 3,500. For his service he receives an average of $2.73 per patient per year. It has been estimated that a doctor must see more than one hundred patients each day in order to maintain an average net income of $4,000 a year.

Few general practitioners are allowed the use of British hospitals. These are reserved for the medical specialist, also a government salaried employe.

By contrast, a Health Insurance Foundation survey indicates that the average American family doctor treats about twenty-six patients a day and spends about eight hours each day on house and hospital calls. The survey also showed that at least three-quarters of the physicians interviewed were in private practice. In contrast to the British National Health Service system, the survey showed that seven out of eight American doctors were affiliated with one or more hospitals.

It has been said that as a nation's health goes, so goes the nation. America is the healthiest nation in the world and will continue to set the pace in this respect only as long as the freedom of medical practice is maintained.

Like Britain, government controlled medicine has replaced freedom of medical practice in Germany, France and the trend is growing. In Canada, busy physicians and private insurance companies were shocked with the suddenness of the enactment of a government controlled hospital care program. Canadian observers state that political steam roller tactics were successful in part because busy physicians failed to acquaint themselves with the facts. Passage of the Forand Bill could effect similar results in the United States.

The House Ways and Means Committee Hearings on the Forand Bill concluded July 17. Those who favored passage of legislation which would eventually provide compulsory government health care for all Americans, took time to present their case. The American Medical Association, along with other agencies and organizations opposing the Forand Bill, pointed out to legislators why Americans do not need the Forand type of legislation.

Unless we as individual physicians and county medical societies can do a first class job of urging legislators that medicine and politics do not mix, suddenly we may discover that we, too, are employes in a government controlled health service.

Sincerely yours,

Benjamin B. Foulston M.D.

President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

EMPLOYE MEDICAL PROGRAMS SHOW MARKED INCREASE

Company medical programs for employes have been greatly broadened since the turn of the century, and many American firms now are taking active steps not only to treat job-connected injuries and diseases but to prevent them, the National Industrial Conference Board reports in a recently released study by that organization.

In many cases, the Conference Board finds, this prevention program extends also to nonoccupational ailments through health maintenance measures which provide periodic physical examinations of employes.

Co-operators in the study list many reasons for their desire to keep the worker occupationally fit at all times. Among them is the fact that competition for efficient personnel has impressed upon managements the importance of safeguarding the health of their employes, in whom they have invested time and money.

The physical well-being of employes is not the only occupational health problem of concern among many of these companies. The NICB study finds that increasing attention is being focused by some firms on the control of mental disease among their employes.

U. S. and Canadian Firms Studied

Thirty-six Canadian companies and 242 United States firms provided information for the Conference Board study. In addition, a number of concerns permitted the NICB to study their medical departments and services through field trips.

The employe health and medical programs maintained by these companies cover a wide range. More than four-fifths of the United States companies and almost nine-tenths of the Canadian group require preplacement physical examinations of every prospective employe including those on the executive level. Periodic physical examinations also are becoming an increasingly common practice among companies. Better than four-fifths of the co-operators give periodic examinations either to all or to selected groups of employes.

Physical examinations following temporary layoffs are required by three-fifths of all U. S. co-operating companies and by more than two-fifths of the Canadian respondents. An examination at the termination of employment, however, is a less frequent practice. About 15 per cent of the U. S. co-operators and only three of the responding Canadian firms have such examinations.

Few Dentists on Payrolls

Only a handful of the co-operating American companies, and none of the Canadian firms, employ dentists full or part time, according to The Conference Board. Many respondents believe that an in-plant dental program is an additional and unnecessary expense.

More than three-fourths of the U. S. co-operating firms and two-thirds of the Canadian respondents have eye protection programs of some kind. These include not only testing of employes, but, in many cases, an evaluation of each job and work area in a company to determine the hazards involved, the degree of eyesight required, and the kind of eye protection needed.

Care of Hearing is Expanding

While auditory examinations and measures to provide ear protection are not as common as eye protection programs, industry in recent years has become increasingly conscious of compensation risks entailed in excessive noise, the NICB finds. As a result, many companies have instituted programs which include efforts to reduce noise in the plant and auditory tests during an employe's working life to determine how much hearing loss is the result of work surroundings and how much is due to his own physical deterioration. About a fourth of the U. S. co-operating companies have some kind of ear protection plan and about 11 per cent more plan to have them. Slightly under one-fourth of the Canadian firms either have, or plan to have, such services.

Mental hygiene is considered important in many companies, although only ten of all responding firms employ psychiatrists. The medical personnel in a large percentage of all co-operating companies offer a type of counseling service designed to help the employe lead a better adjusted life. They counsel employes on how to care for themselves—how to eat, rest, relax, avoid accidents, get

along with associates—and how to live with or remedy any physical impairments.

Since the job environment is closely associated with the health of workers, attention to atmospheric conditions, working materials and processes, and physical equipment and surroundings is of concern to medical personnel. Among 199 United States and Canadian co-operating firms that have industrial hygiene programs, about 73 per cent make the medical department responsible for them.

Scope of a Program

Many factors influence the scope of activity of the medical departments maintained by co-operating companies, the NICB study finds. These include the size of the firm, the type of business it is engaged in, and the attitude of top management toward the need for a comprehensive program requiring the investment of substantial funds.

A more subtle influence, but one that finally determines the extent of medical operations in many companies, is the differing philosophy of doctors, and very often of company managements, as to what a preventive health program can include without putting the company in the position of practicing medicine.

MAJOR CLOSED PANEL HEALTH CARE PLANS MERGED

Two organizations representing fifty major closed panel health care plans have joined forces. Merger of the American Labor Health Association and the Group Health Federation of America to form the Group Health Association of America was announced May 26.

How this powerful "straw in the wind" can affect the future course of "free choice" cannot be immediately determined. However, physicians are advised to keep abreast of the progress of the combined forces represented by Group Health Association of America.

Publications of the combined groups assert that the merger represents the most important event in the organization of medical care for the consumer since the advent of modern medical science. Members are being told that the new organization will speak in the interests of all consumers of medical care—labor union members, city people and farmers, as well as subscribers to group health plans.

GHAA will not only protect consumers' right to organize group health plans to prepay their health costs, leaders declared, but will uphold the right of physicians to work with these plans.

According to Jerry Voorhis, Executive Secretary, this historic meeting "marks a most important milestone in the progress of the earnest, wise and devoted people who have given so generously of their time, talent, and money to the group health movement during the past two decades. Perhaps ours is an idea whose hour has indeed come. At least we should proceed in faith that that is so."

A four-point legislative program was adopted by the new organization. The program would: Vigorously support the Humphrey Bill, S. 2009, to provide long-term interest bearing loans for the building and equipping of health centers financed by prepaid loans. Horace R. Hansen, GHAA's general counsel, reported that a cursory survey of a limited number of prepaid plans disclosed they could use $37 million for building and $7 million for equipment; Endorse an amendment to the tax laws to give nonprofit health plans operating health facilities a tax classification to make them eligible to receive gifts which would be tax deductible for the donors; Endorse the principle of the Forand Bill—the use of the Social Security mechanism to pay for health care for the aged; Endorse the principle of health insurance to Federal civilian employees, including the right of the employees to choose coverage by prepaid comprehensive health plans.

Call to Action

GHAA legal counsel, Horace R. Hansen, St. Paul, outlined the following vigorous program designed to remove the barriers to closed panel plans. He recommended that the group: Support lawsuits brought by individual plans against "vicious medical boycotts in operation against lay plans." Mr. Hansen claimed that "in every lawsuit in the last twenty years involving boycott, the plan has prevailed over the (medical) society." "Acquaint hospital boards and the many religious organizations, which endow them, with the purposes of our plans and the selfish designs of the local medical society in drawing hospitals into disciplinary action against our doctors."

Also proposed by Mr. Hansen was a state "hospital nondiscrimination bill." Such legislation would provide that "a hospital may not discriminate against a doctor seeking privileges, solely because of his association with the plan, while reserv-

ing any other legitimate reasons for denying privileges."

Organized "watch dog" committees in each state in advance of legislative session to combat bills restricting closed panel plans and to urge repeal of such laws now in force in twenty-six states.

To support these committees, Mr. Hansen said, "We should start actions testing such provisions in some states having restrictive legislation, on grounds that giving organized medicine a virtual monopoly in operating a prepayment plan is unconstitutional, as being vague, as being class legislation, and as unlawfully delegating administrative authority."

Mr. Hansen also urged that the states set up mechanisms in addition to licensures for policing the quality of medical care. He also recommended that two lay persons be included on each State Board of Medical Examiners in order "to provide a window into the conduct of medical practice."

GHFA Founded in Minnesota

Group Health Federation of America was organized thirteen years ago at Two Harbors, Minnesota, as Cooperative Health Federation of America. In 1957, again at Two Harbors, the name was changed to Group Health Federation.

American Labor Health Association was formed seven years ago, as the Association of Labor Health Administrators with a membership made up of individuals. Again the combined publications of the groups point out that for many years the two like-minded organizations worked side-by-side with the same purpose—to spread their mutual belief that better medical care for the American people can come about through consumer-sponsored, comprehensive prepaid, group practice plans.

They state that "Group Health" was retained in the title of the new organization because it has a definite meaning in law and in the organization of medical care as well as in the minds of the people.

ACCORDING TO CITATION . . .

Exclusion of Osteopaths from Staff of County Hospital Upheld

The Court of Civil Appeals of Texas has held that osteopaths can be excluded from the staff of a county hospital because they hold only degrees of doctor of osteopathy.

At the same time, the Court stated that the rule of the Board of Trustees of the hospital requiring county hospital members to be graduates of Schools of Medicine approved by the American Medical Association, while reasonable, was invalid "because it constitutes a delegation of power by the Board to itself to determine the qualifications of its staff members. There is nothing, in our opinion, which will prevent the Board from adopting the same standards as are required at a given time by the American Medical Association."

DIABETIC ACIDOSIS

(Continued from Page 1075)

References

1. Reubi, F. C.: Glomerular filtration rate, renal blood flow and blood viscosity during and after diabetic coma. Circulation Res., 1:410-413 (Sept.) 1953.
2. Bernstein, L. M.; Foley, E. F.; and Hoffman, W. S.: Renal function during and after diabetic coma. J. Clin. Invest., 31:711-716 (July) 1952.
3. Howard, J. E.: Observations on the therapy of diabetic acidosis. Proc. Am. Diabetic A., 10:152-159, 1950.
4. Danowski, T. S.; Winkler, A. W.; and Peters, J. P.: Salt depletion, peripheral vascular collapse and the treatment of diabetic acidosis. Yale J. Biol. & Med., 18:405-417 (May) 1946.
5. Howarth, Sheila; McMichael, J.; and Sharpey-Schafer, E. P.: Low blood pressure in diabetic coma. Clin. Sc., 6:247-255 (Feb. 16) 1948.
6. Lange, Kurt; Graig, Frank; Tchertkoff, Victor; Oberman, Jacob; and LoCasto, Fred: The effects of experimental acidosis on the dynamics of circulation. Am. J. M. Sc., 222:61-65 (July) 1951.
7. Frenkel, M.; Groen, J.; and Willebrands, A. F.: Low serum potassium level during recovery from diabetic coma with special reference to its cardiovascular manifestations. Arch. Int. Med., 80:728-738 (Dec.) 1947.
8. Trever, R. W., and Cluff, L. E.: The problem of increasing azotemia during management of diabetic acidosis. Am. J. Med., 24:368-375 (Mar.) 1958.
9. McCance, R. A., and Lawrence, R. D.: The secretion of urine in diabetic coma. Quart. J. Med., n.s., 4:53-79 (Jan.) 1935.
10. Aoyama, Shigeto, and Kolff, W. J.: Severe diabetic acidosis treated with the artificial kidney: Report of a case complicated with acute renal failure. J.A.M.A., 166:9-11 (Jan. 4) 1958.
11. Kalinowski, S. Z., and Walker, J. M.: Diabetic coma associated with lipaemia and complicated by uraemia. Brit. M. J., 2:661-662 (Sept. 19) 1953.
12. Brody, D. A.: Lower nephron syndrome in association with diabetic coma: Report of two cases. Memphis M. J., 23:71-72 (Apr.) 1948.
13. Harwood, Reed: Diabetic acidosis: Results of treatment in sixty-seven consecutive cases. New England J. Med., 245:1-9 (July 5) 1951.
14. Merrill, J. P.: The Treatment of Renal Failure: Therapeutic Principles in the Management of Acute and Chronic Uremia. New York: Grune & Stratton, Inc., 1955.

The Art of Medicine

PR

Carl H. Woyke, B.A.
Editor

DOCTORS' FEES PRO AND CON

Whenever doctors' fees are discussed, the art of medicine of every member of the medical profession is immediately involved.

Recently George E. Sokolsky, a King Feature Syndicate editorialist, wrote one article on doctors' fees. The original article prompted a large mail response from the readers of Mr. Sokolsky's column. A second article was devoted to presenting the pros and cons of doctors' fees as reflected in the letters which the columnist received.

In his second article, Mr. Sokolsky commented:

"I have received a rather large mail in response to an article I wrote about doctors' fees. Those who complain have several arguments which ought to be aired. On the subject that doctors' fees are exorbitant, I can hardly agree with the critics. A man is entitled to charge what he thinks his services are worth. If an hourly wage worker wants more money for his work, he might go on strike to get it. School teachers and other city employes threaten to go on strike for more money.

Called Scalper

"But if a doctor charges what he thinks his services are worth, he is called a scalper. A reader writes: '. . . Too many doctors today are absolutely commercial. They are thinking more of the almighty dollar than of the patient. . . .'

"A doctor can think about his patients all day long, but he still has to pay for taxes, rent, food and clothing, books, publications and instruments.

"He has no way of earning a living except by charging for his time, skill and services.

"Some physicians and surgeons may charge more than their patients want to pay. This is a private transaction involving two individuals who can usually reach an understanding in advance of the services being rendered.

"The complaint is made that doctors are hard to find on Wednesday afternoons and Sundays.

"This is one of the most difficult problems to solve. Folks get sick every day and at all hours of the day, but it is inhuman to expect that a doctor or anyone else will be around twenty-four hours a day, 365 days a year.

"He might like to go fishing, too. He might like to visit his mother or attend a convention. He might even want to go to a show with his wife or to go courting so he can get a wife.

Larger Cities

"In the larger cities, arrangements are usually made by doctors to cover for their colleagues through a telephone answering service.

"It does not always work out satisfactorily, particularly in a real emergency. Local medical associations ought to work out these problems satisfactorily.

"It would be both an opportunity and an experience for young interns to service such an emergency committee directly under a medical association so that doctors could be free on Sunday and Wednesday afternoons which some take off as a break.

"The doctor who refuses under any circumstances to go on a house visit is wrong. I have never encountered such a physician, not even a specialist, but if there are such, they should be pilloried. There can be no reason for an absolute refusal to make a house call.

"The criticism that doctors insist that patients go to a hospital for treatment is stupid.

"That is the best place to go to. It is impossible to give a patient as competent a treatment as in a hospital.

Shortage

"When a doctor instructs a patient to go to a hospital, that is where the patient should go. It is unfortunate that there is a shortage of hospitals in this country and it is a crime that some of the hospital workers in our large cities are being organized by professional union operators.

"Of course, everybody who works in a hospital is underpaid but it also is true that practically no hospital is in the black.

"The suggestion that comes from one reader that 'doctors use all of the facilities of hospitals as places of business, putting it bluntly, without paying a cent for the privilege' strikes me as particularly nonsensical.

"Any hospital-connected physician, having a private practice, works for that hospital for free. If hospitals had to pay doctors for all the work they do in the hospital, institutions would have to close down after the first year's budget.

Conclusion

"After reading quite a large number of letters, I have reached the conclusion that many persons expect to get medical services for nothing; that they do not appreciate that a physician is a human being with the usual habits, ailments and requirements of other human beings; that many Americans have lost the habit of paying-as-you-go but have, because of the depression and the wars, taken on a habit of having things done for them; that they do not appreciate top value but will accept what comes so long as it costs nothing."

ARE DOCTOR PUBLIC RELATIONS IN TRANSITION?

"Have the people of America really changed their attitude toward their doctor?" inquires an editorial in the *Westchester Medical Bulletin.*

"The doctor of a few generations ago certainly was a revered and respected person. Judging from the tone of many magazine and newspaper articles, this is no longer true. It seems that anti-doctor literature is very popular with the press and that people really want to read it. Lambasting doctors and their attitudes and their fees has become a frequent pastime of some metropolitan newspaper writers. When circulation slumps a series of articles criticizing organized medicine would appear to be a good remedy. This is apparently true with the popular magazines, also.

"Is this done because the readers wish to see their physicians placed in such poor perspective? The best that we seem to be able to do in the press is to make occasional, feeble and belated denials of charges that are untrue. If the press does express the attitude of the people, then physicians everywhere should do some serious self-examination.

"Certainly the failure to maintain esteem does not arise from the lack of excellence of medical care. This is, today, better than it has ever been, and patients know it. The dissatisfaction, then, must lie elsewhere, and perhaps we have not far to look to find it.

"In recent years the development and extensive use of specific drugs have shortened, simplified, and in some cases, eliminated diagnosis. The greater employment of laboratories and diagnostic machines has gone a long way toward seeming to eliminate the doctor. The use of machines and drugs is not a reversible process, nor would we want it to be. However, it does result in some feeling by the patient that it is not entirely the doctor who is helping him.

"Overspecialization has also aroused the irritation of the public. 'Nowadays,' the patient complains, 'I have to sit down and figure out for myself whether I need a chest man, a bone man, a heart man, a stomach man or some kind of man I've never even heard of, and then when I do decide, I don't know where to find him.' So he settles for going to a clinic where he is certainly not treated as an individual but feels at some point in the series of doctors he sees he'll encounter the one who goes with his ailment.

"There are no ready answers to the problem but it seems clear that we, the doctors, should make an extra effort to show interest in the patient as an individual and let him know that mechanization and specialization has not basically changed us. In addition, a well planned constructive public presentation of the doctor's case should be made."

"DOCTOR, TELL ME" IS ON VACATION

The current "Doctor, Tell Me" series has ended. The final program, "Vacations" was scheduled to be heard on the twenty-five participating Minnesota radio stations during the week of July 26. The series will resume its regular schedule during the week of October 26.

Meanwhile, regional county medical societies and individual members can perform an important public relations gesture by extending personal and written appreciation to radio stations in their immediate areas which have scheduled "Doctor, Tell Me" in 1958-59.

Radio stations which participated in the recently conducted series included:

KATE—Albert Lea; KXRA—Alexandria; KBMO—Benson; KLIZ—Brainerd; KROX—Crookston; KDLM—Detroit Lakes; KDAL—Duluth; WELY—Ely; WEVE—Eveleth; KSUM—Fairmont; KDHL—Faribault; KOZY—Grand Rapids; KLFD—Litchfield; KYSM—Mankato; KMHL—Marshall; KNUJ—New Ulm; WCMP—Pine City; KLOH—Pipestone; KLGR—Redwood Falls; KFAM—St. Cloud; KTRF—Thief River Falls; KUOM—Twin Cities; KWAD—Wadena; KWLM—Willmar; KWNO—Winona; KWOA—Worthington.

Your state office is interested in receiving your program ideas for the coming year. If the radio station in your immediate area has not previously scheduled "Doctor, Tell Me," a personal chat by you or another member of your county society with the program director might provide the necessary encouragement.

Please forward to this office the names of additional radio stations which have expressed interest in the "Doctor, Tell Me" series. Further details regarding tapes and schedules will be provided.

Public Health

IT'S A LAW

Register Ionizing Radiation Sources

Regulations of the Minnesota State Board of Health adopted in December, 1958, require the registration of all sources of ionizing radiation with the Minnesota Department of Health on special forms provided by the Department biennially in odd numbered years. The regulations provided for an initial registration during the month of March, 1959.

During February of this year, the forms for this registration procedure were sent to more than 1,300 physicians in Minnesota. As of July 1, approximately 500 physicians had registered their ionizing radiation sources, including x-ray equipment, with the Department. There is good reason to believe that a great many x-ray machines have not yet been registered. All physicians in Minnesota, therefore, who have x-ray equipment and have not registered them, are strongly urged to do so. If registration forms were not received, or if they have been mislaid, additional forms are available from the Division of Environmental Sanitation, Minnesota Department of Health, University Campus, Minneapolis 14, Minnesota.

REPORT POLIO CASES IMMEDIATELY

Physicians are requested to report promptly all cases of *paralytic poliomyelitis* by telephone to the Minnesota Department of Health, FEderal 9-7751, University Campus, Minneapolis. The department wishes to know especially (1) the type and extent of disease present; (2) the vaccination status: number of doses, and dates of inoculations; (3) name, age, address, date of onset of symptoms of the patient.

For the laboratory confirmation of the diagnosis, one or two stool specimens from the patient are most useful and should be submitted routinely and early; virus isolation containers should be used. If ordinary stool bacterial culture outfits are used, the special preservative should be dumped out and the data card marked "For Polio Virus."

Paired blood specimens, the first collected immediately after onset of the disease, the second two to four weeks later, are required.

QUARANTINE COVERAGE OF ST. LAWRENCE SEAWAY TRAFFIC

The Public Health Service Division of Foreign Quarantine and its Canadian counterpart, in considering the health problems associated with the St. Lawrence Seaway traffic, find that inspection of this traffic can best be done before shipping is allowed to enter the Seaway. Accordingly, Division of Foreign Quarantine is detailing a staff of four quarantine inspectors to Montreal to cover this work co-operatively with the Canadian health administration. This detail is headed by Quarantine Inspector William F. Reider, and will be responsible to Medical Director Alonzo Brand, Medical Officer in Charge, U. S. Public Health Service, American Consulate General, Toronto, Canada, who will maintain necessary liaison with Dr. W. H. Frost, Chief, Quarantine, Immigration Medical and Sick Mariners Service, Department of National Health and Welfare, Ottawa, Canada. The address of this detail is: United States Public Health Service, Seaway Quarantine Operation, 320 Baldwin Street, Montreal 5, P. Q., Canada.

The following functions will be performed:

1. Persons will be given physical inspection, including review of their immunization records, on arrival from foreign countries (except arrival direct from Canada, the Islands of St. Pierre and Miquelon, Iceland, Greenland, the West Coast of Lower California, Cuba, the Bahama Islands, the Canal Zone, the Bermuda Islands, the British Virgin Islands, or the Islands of Aruba and Curacao), and control measures will be applied according to Public Health Service Foreign Quarantine Regulations. Persons with any evidence of serious communicable disease will be referred to Canadian health officials for appropriate action before the vessel is cleared.

2. Arriving aliens will be inspected pursuant to immigration-medical requirements, with special attention to immigrants and alien seamen. Findings will be reported to the Immigration and Naturalization Service.

3. Sanitary inspection of vessels will be performed, including inspection for presence of rodents and other disease vectors. The intensity and type of inspection will vary as the need indicates. Findings on American flag vessels, other than rodent infestation, will be reported to the Public Health Service Regional Medical Director for action. Necessary action on foreign flag vessels will be taken by Division of Foreign Quarantine. Responsibility for rodent control on all ships arriving from foreign ports rests with Division of Foreign Quarantine.

4. Other "things" aboard the ship will be inspected for compliance with import requirements. These items, covered in Subpart J of Public Health Service Regulations, include lather brushes, dogs, cats, monkeys, psittacine birds, shipments of disease organisms and vectors, and dead bodies.

Ships not bearing a valid deratting or deratting exemption certificate (pursuant to International Sanitary Regulations) will be given special inspection, and will be deratted or given the exemption certificate as the findings indicate.

Questions or problems in connection with the program should be addressed to Andrew P. Sackett, Medical Director, Chief, Division of Foreign Quarantine Bureau of Medical Services, Department of Health Education and Welfare, Washington 25, D. C.

Minnesota Blue Shield-Blue Cross

The Blue Shield statistical report for the first four months of this year reveals continued increases in utilization of contracts by participant subscribers. 128,992 doctors' services were provided benefits by the Plan during the months of January through April, 1959. This figure represents an increase of 11,742 services over the number paid by Blue Shield in the same period of 1958.

Payments to physicians also increased in the first four months of 1959 over the same months of last year. As of April 30, 1959, Blue Shield had paid $3,463,726 for subscriber care while $3,248,614 was paid to doctors for services to subscribers as of the same date in 1958. Thus, Blue Shield paid $215,112 more to physicians during the first four months of 1959 than was paid by the Plan in the same months of last year.

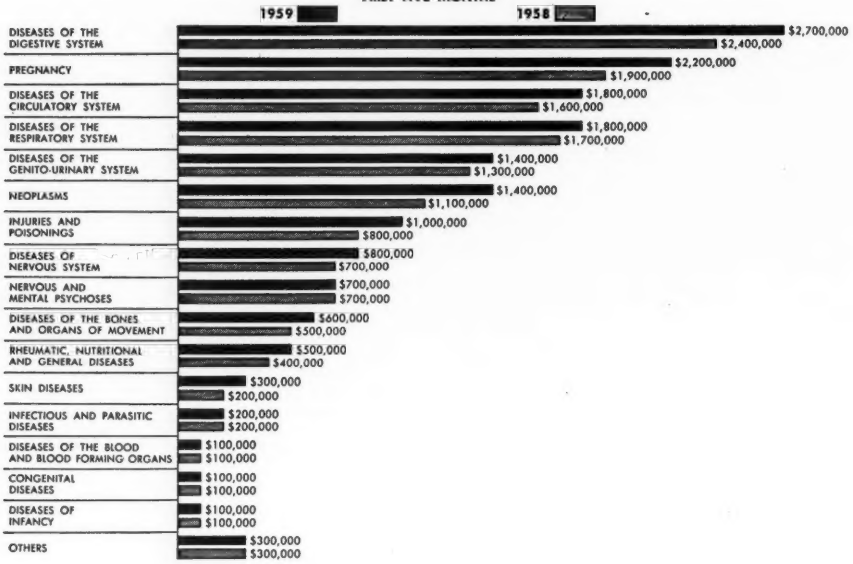
A breakdown of Blue Shield payments according to Plan A and Plan B shows that most of the increase in 1959 over 1958 is accounted for in Plan B benefits. Plan B payments in the first four months of 1959 were $595,039 as compared to $437,003 last year. Plan A benefits amounted to $2,868,686 January through April of this year and $2,811,610 during the same period of 1958.

Blue Cross payments to hospitals during the first five months of 1959 for care incurred by subscribers and dependents totaled $16,017,300, an increase of $1,876,489 or 11.7 per cent over Blue Cross hospitalization expense incurred during the same period of the previous year. Approximately one-half of this increase in Blue Cross payments to hospitals occurs in the hospital care costs incurred by Blue Cross patients hospitalized because of diseases of the digestive system, pregnancy, diseases of the circulatory and respiratory systems.

Blue Cross membership growth, the transfer of subscribers to higher levels of benefits and the increased subscriber usage of Blue Cross benefits are not the only contributing factors to this significant increase in Blue Cross hospitalization expense.

Progress being constantly achieved in hospital facilities, increased subscriber usage of these facilities, improvements in the field of modern medicine and increased cost of hospital operation are continuing to play a major role in the continued spiral of Blue Cross costs.

COMPARISON OF BLUE CROSS PAYMENTS TO HOSPITALS FOR SUBSCRIBERS' CARE
(ROUNDED TO NEAREST 100,000 DOLLARS)
BY DISEASE CLASSIFICATION OF CASES PAID
FIRST FIVE MONTHS



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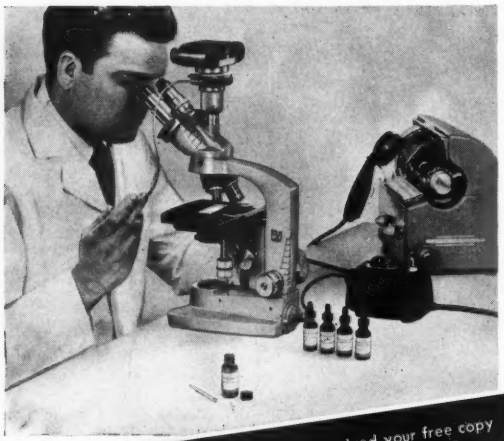
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Communications

This Section is for you to voice your convictions, comments, and queries on all subjects political, economic, historic, humorous, scientific or otherwise, to many physicians. Writings not sufficiently formal and too brief for an editorial or a scientific manuscript are requested. Clinical and research observations, no matter how brief, similar to those in *The Lancet* (London), are particularly encouraged.

HEART GRANTS

Sixty heart research grants totaling $216,750 were awarded at the twelfth annual meeting of the Minnesota Heart Association held in Minneapolis, in July.

The grants, allocated from the 1959 Heart Fund drive, will be spent in laboratories at eight Minnesota institutions, and will finance studies into all forms of heart and circulatory diseases.

Most of the grants went to University of Minnesota researchers (46). Others went to scientists at Mayo Clinic, Rochester; Hormel Institute, Austin; Minneapolis General Hospital; Mt. Sinai, Hospital, Minneapolis; St. Barnabas Hospital, Minneapolis; St. Joseph's Hospital, St. Paul; and St. Mary's Hospital, Duluth.

Three awards were fellowships to outstanding young scientists who will work and train under experienced researchers. Two others were to Established Investigators who are receiving long term support from the Minnesota Heart Association.

In addition, the Association voted to double its summer fellowships program for high school and college students, and allocated $10,000 for this purpose in 1960. The program will continue in its third consecutive year at the Mayo Clinic and University of Minnesota.

Total income from the 1959 Heart Fund drive was reported at $597,573, representing 115 per cent of the state goal.

MINNESOTA HEART ASSOCIATION
BY EIVIND J. HOFF, JR.

St. Paul, Minnesota
July 15, 1959

IS THERE A RHEUMATIC CONSTITUTION?

The low incidence of rheumatic fever among the many individuals infected with streptococcal disease, even when untreated, has led to the suggestion that it is not the germ, nor the infection, but rather the constitution of the victim that is crucial in the pathologic constellation of rheumatic fever. A study of physical appearance, body build, blood groups, and saliva tests in active and inactive cases of rheumatic fever showed no significant statistical difference from that in the general population. The one positive constitutional feature brought out in this study is hyperextensibility of the joints.—EUGENE F. DIAMOND, M.D., *Journal of Pediatrics,* March, 1959.

In Memoriam

CONRAD M. DOVRE

Dr. Conrad M. Dovre, retired St. Paul physician, died June 22, 1959, at his home at 1787 James, St. Paul. He was seventy-four years old at the time of his death.

Dr. Dovre was born in Oslo, Norway, and came to the United States in 1905. He was a graduate of Marquette University Medical School in Milwaukee, Wisconsin, and interned for one and a half years at St. Joseph's Hospital in St. Paul.

Dr. Dovre began his practice in 1913 at Rice and University in St. Paul and later moved to the Hamm Building. He practiced there until the time of his retirement in 1953. He was a member of the Ramsey County Medical Society, the Minnesota State Medical Association and the Ancient Landmark Number Five, Masonic Lodge.

Survivors are his wife, Esther, and two sisters in Norway.

CONRAD A. NEUMANN

Dr. Conrad A. Neumann, Holler Hill, Winona, died July 6, 1959. Dr. Neumann was seventy-seven years old at the time of his death. His preliminary education was obtained in the Winona High School and later he attended the University of Minnesota.

He received his medical degree from Northwestern University School of Medicine. Following his internship in the Milwaukee County Hospital, he returned to Lewiston in 1909 and practiced there until 1927. He established residence in Winona in 1928 when he joined the staff of the Winona Clinic. In 1948, he retired from the Winona Clinic, moved to Holler Hill, Winona, and resumed his practice in Lewiston.

He was a member of the Winona County Medical Society, Minnesota State Medical Association and the American Medical Association.

Dr. Neumann was named a member of the Fifty-year Club of the Minnesota State Medical Association in 1959.

Survivors are his brother, John H. Neumann, Lewiston; two sisters, Lydia, Downers Grove, Illinois, and Anna, Seattle, Washington; and two daughters, Mrs. Milan A. Johnston, Minneapolis; and Mrs. John S. Lucas, Winona.

ON SUDDEN OR RAPID WHITENING OF THE HAIR

A case is cited of a man who experienced complete whitening of the hair of the head in not more than six weeks after an accident. Seventeen months after this accident, the author had a chance to re-examine the patient, who had just returned from a trip to Florida and looked sunburned. The patient was worried about the sudden appearance of white spots—vitiligo—on different parts of his body. On re-examination, the author was convinced that the original sudden whitening of the hair in this case, and in many of the previously reported ones, belongs in the group of vitiligos.—ALFRED J. EPHRAIM, M.D., *AMA Archives of Dermatology,* February, 1959.



Meetings and Announcements

STATE

Northern Minnesota Medical Association, annual meeting, Duluth, Minnesota, Friday and Saturday, September 11 and 12.

NATIONAL

Academy of Psychosomatic Medicine, Sixth Annual Meeting, October 15-17, 1959 at the Sheraton-Cleveland Hotel, Cleveland, Ohio. For further information contact Dr. Bertram B. Moss, Suite 1035, 55 East Washington Street, Chicago 2, Illinois.

American College of Surgeons, Annual Clinical Congress, Atlantic City, New Jersey, September 28-October 2. Dr. Michael L. Mason, Secretary, 40 East Erie Street, Chicago 11, Illinois.

American Heart Association, Annual Meeting and Scientific Sessions, October 23-27, 1959, Philadelphia. Scientific Sessions scheduled for October 23-25 at Trade and Convention Center. Annual Meeting of the National Assembly, Hotel Bellevue Stratford, October 26-27. Information available from Minnesota Heart Association, 1821 University Avenue, St. Paul 4, Minnesota.

The annual course in Postgraduate Gastroenterology, sponsored by The American College of Gastroenterology, will be given at The Biltmore in Los Angeles, California, September 24, 25 and 26, 1959. For further information and enrollment, write to the American College of Gastroenterology, 33 West 60th Street, New York 23, New York.

The Academy of Psychosomatic Medicine has announced its Sixth Annual Meeting, October 15-17, 1959, at the Sheraton-Cleveland Hotel in Cleveland. For further information, write to Dr. Bertram B. Moss, Suite 1035, 55 East Washington Street, Chicago 2, Illinois.

The American Rhinologic Society will hold its fifth annual meeting in the Belmont Hotel, Chicago, October 10. The meeting will be preceded by a surgical seminar in the Illinois Masonic Hospital, Chicago, October 7-9. For further information write to Dr. Robert M. Hansen, Secretary, 1735 No. Wheeler Avenue, Portland 12, Oregon.

The American Institute of Ultrasonics in Medicine will hold their Annual Meeting on September 2, 1959, at the Leamington Hotel, Minneapolis, Minn. For any further information contact John H. Aldes, M.D., Secretary, 4833 Fountain Avenue, Los Angeles 29, California.

Interstate Postgraduate Medical Association, Forty-fourth Scientific Assembly, Palmer House, Chicago, Illinois, November 2-5, 1959.

Institute of Industrial Medicine of New York University Post-Graduate Medical School, two-month course for physicians in Occupational Medicine. Presentations include Preventive Medicine, Administrative Medicine, Occupational Diseases, and Industrial Hygiene. The course will be a full-time, two-month course, September 14 through November 6, 1959, tuition—$375, field trip expense—$25. For applications, address Office of the Associate Dean, New York University Post-Graduate Medical School, 550 First Avenue, New York 16, New York.

Mississippi Valley Medical Society, Twenty-fourth Annual Meeting, Chase Hotel, St. Louis, Missouri, September 29-October 1. Complete programs available from Dr. Harold Swanberg, M.D., Secretary, W. C. U. Building, Quincy, Illinois.

National Society for Crippled Children and Adults, Annual Convention, November 29-December 2, 1959, Palmer House, Chicago. For further information, write Miss Catharine Bauer, Director of Information, 2023 West Ogden Avenue, Chicago 12, Illinois.

The Twenty-fourth Annal Congress of the North American Federation, International College of Surgeons, will be held in the Palmer House, Chicago, September 13-17. Surgeons desiring to present papers should write to Dr. Peter A. Rosi, International College of Surgeons, 1516 Lake Shore Drive, Chicago 10.

Pan-Pacific Surgical Association, Eighth Congress, Honolulu, Hawaii, September 28 through October 5 in 1960. Further information and brochures may be obtained by writing to Dr. F. J. Pinkerton, Director General of the Pan-Pacific Surgical Association, Suite 230, Alexander Young Building, Honolulu 13, Hawaii.

A Postgraduate Course in Occupational Skin Problems will be given at the Institute of Industrial Health to be held at the University of Cincinnati, Cincinnati, Ohio, October 26-30, 1959. For further information, write to the Secretary, Institute of Industrial Health, The Kettering Laboratory, Eden and Bethesda Avenues, Cincinnati 19, Ohio.

Twelfth Annual Meeting of the American Association of Blood Banks, Edgewater Beach Hotel, Chicago, Illinois, November 4-7, 1959. For further information write, Office of the Secretary, American Association of Blood Banks, 30 North Michigan Avenue, Chicago 2, Illinois.

Twelfth Annual Conference on Electrical Techniques in Medicine and Biology, Sheraton Hotel, Philadelphia, Pennsylvania, November 10-12, 1959. For further information, write Dr. Herman P. Schwan, Moore School of Electrical Engineering, University of Pennsylvania, Philadelphia, Pennsylvania.

Eighty-seventh Annual Meeting of the American Public Health Association, Atlantic City Convention Hall, Atlantic City, New Jersey, October 19-23, 1959.

INTERNATIONAL

Eighth Bahamas Medical Conference, British Colonial Hotel, Nassau, Bahamas, November 27 until December 17, 1959.

(Continued on Page 1122)



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INTERNATIONAL

(Continued from Page 1120)

Second Bahamas Surgical Conference, British Colonial Hotel, Nassau, Bahamas, December 28, 1959 until January 16, 1960.

International College of Surgeons, Twelfth Biennial International Congress, Rome, Italy, May 15-18, 1960.

Fourth International Goiter Conference, July 5-9, 1960, London, England, under the auspices of the London Thyroid Club and the American Goiter Association. Application blanks are available from John C. McClintock, M.D., 149½ Washington Avenue, Albany 10, New York, U.S.A.

North American Federation, Twenty-Fourth Annual Congress, International College of Surgeons, Chicago, September 13-17. For information, write The Secretariat, International College of Surgeons, 1516 Lake Shore Drive, Chicago 10.

Pan American Medical Association Congress, Mexico City, Mexico, May 2-11, 1960. For further information, write Dr. Joseph J. Eller, Director General, 745 Fifth Avenue, New York, New York.

Pan-Pacific Surgical Association, Eighth Congress, Honolulu, Hawaii, September 27 to October 5, 1960. For further information, write to The Pan-Pacific Surgical Association, Travel Headquarters, 36 South Wabash Avenue, Chicago 3, Illinois.

UNIVERSITY OF MINNESOTA CONTINUATION COURSES

Courses of Interest Primarily to Physicians Engaged in General Practice

1959

October 5-7; Obstetrics—Registration $5.00, Tuition $35.00—Total $40.00.

October 22-24; Dermatology—Registration $5.00, Tuition $35.00—Total $40.00.

November 16-18; Fractures—Registration $5.00, Tuition $35.00—Total $40.00.

1960

February 8-10; Cardiovascular Diseases—Registration $5.00, Tuition $35.00—Total $40.00.

February 29-March 2; Pediatrics—Registration $5.00, Tuition $35.00—Total $40.00.

March 14-16; Internal Medicine—Registration $5.00, Tuition $35.00—Total $40.00.

March 19; Trauma—Registration and tuition $10.00.

March 28-April 1; Endocrinology—Registration $10.00, Tuition $55.00—Total $65.00.

April 11-13; Radiology—Registration $5.00, Tuition $35.00—Total $40.00.

April 21-23; Otolaryngology—Registration $5.00, Tuition $35.00—Total $40.00.

May 2-6; Intermediate Electrocardiography—Registration $10.00, Tuition $55.00—Total $65.00.

May 16-18; Office Psychotherapy—Registration $5.00, Tuition $35.00—Total $40.00.

All year: Cancer Detection—Registration $5.00 ($25.00 paid by the American Cancer Society).

(Continued on Page 1124)

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(Continued from Page 1122)

Courses of Interest Primarily to Physicians with Practices Limited to Special Fields
1959

September 22-24; Pediatrics—Registration $5.00, Tuition $35.00—Total $40.00.

November 2-6; Gastrointestinal Radiography—Registration and Tuition $10.00.

November 14-16; Fractures—Registration $5.00, Tuition $35.00—Total $40.00.

November 19-21; Physical Medicine—Registration $5.00, Tuition $35.00—Total $40.00.

1960

January 11-13; Ophthalmology—Registration $5.00, Tuition $35.00—Total $40.00.

January 21-23; Surgery—Registration $5.00, Tuition $35.00—Total $40.00.

February 8-10; Cardiovascular Diseases—Registration $5.00, Tuition $35.00—Total $40.00.

February 15-19; Pediatric Neurology—Registration $10.00, Tuition $55.00—Total $65.00.

March 14-16; Internal Medicine—Registration $5.00, Tuition $35.00—Total $40.00.

April 7-9; Emergency Surgery—Registration $5.00, Tuition $35.00—Total $40.00.

May 2-6; Intermediate Electrocardiography—Registration $10.00, Tuition $55.00—Total $65.00.

June 13-15; Gynecology—Registration $5.00, Tuition $35.00—Total $40.00.

UNIVERSITY OF NEBRASKA, POSTGRADUATE COURSE

The University of Nebraska College of Medicine will offer the first of a ten-course series of postgraduate programs September 28-30. Dr. Enrique Cabrera, Institute of Cardiology in Mexico City, will team up with Dr. Eugene Lepeschkin, University of Vermont, to present the three-day course in Advanced Electrocardiology. The course fee is $50.00. Applications should be made to Office of Medical Extension, University of Nebraska College of Medicine, 42 and Dewey, Omaha 5, Nebraska.

DOCTORS' NURSES ORGANIZE

The American Association of Doctors' Nurses, a new non-profit association, has been incorporated to assume the membership of the old American Registry of Doctors' Nurses. This measure has been taken in order to eliminate the legitimate objections of other nursing groups.

The purpose of the new association is to promote the welfare of its members, to elevate the standards and ethics of their profession, and to enroll doctors' nurses in order that they may advance their status as proven members of that profession.

The membership is composed of not only those whose experience has been entirely in doctors' offices, but also trained nurses and practical nurses who are not serving in hospitals, nor engaged in private duty, but are now serving in doctors' offices. At present there are members in forty-eight states, Puerto Rico, and the Republic of Panama.

The doctor's nurse must be able to qualify as an ex-

(Continued on Page 1126)



If she needs nutritional support . . . she deserves

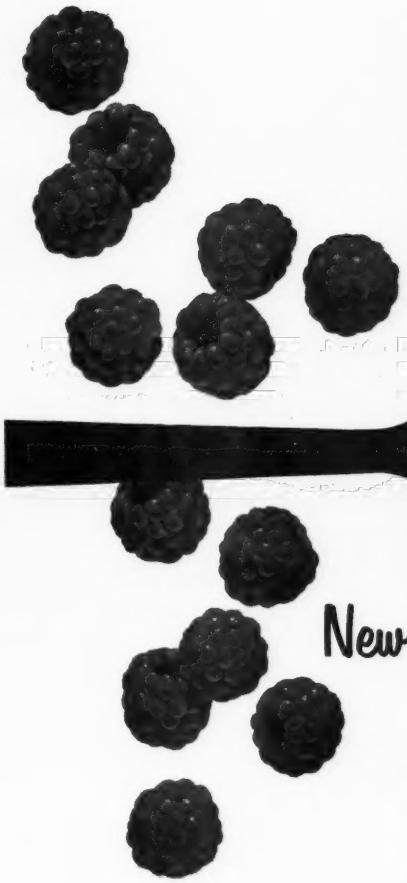
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POMALIN™ Liquid

New RASPBERRY FLAVOR

and pink color make POMALIN pleasant to take and appealing to both children and adults.

- ✓ Curbs excessive peristalsis
- ✓ Adsorbs toxins and gases
- ✓ Soothes inflamed mucosa
- ✓ Provides intestinal antisepsis

FORMULA:

Each 15 cc. (tablespoon) contains:

Sulfaguanidine	2 Gm.
Pectin	225 mg.
Kaolin	3 Gm.
Opium tincture	0.08 cc.
(equivalent to 2 cc. paregoric)	

SUPPLIED:

Bottles of 16 fl. oz.
Exempt Narcotic.
Available on Prescription Only.

DOSAGE:

ADULTS: Initially 1 or 2 tablespoons from four to six times daily, or 1 or 2 teaspoons after each loose bowel movement; reduce dosage as diarrhea subsides.

CHILDREN: ½ teaspoon (=2.5 cc.) per 15 lb. of body weight every four hours day and night until stools are reduced to five daily, then every eight hours for three days.

Winthrop LABORATORIES
New York 18, N. Y.

(Continued from Page 1124)

perienced doctor's nurse in order to become a member, and her application for membership must be signed by a Doctor of Medicine.

The Association maintains its headquarters in the American Building, Washington, D. C.

NATIONAL SOCIETY FOR CRIPPLED CHILDREN AND ADULTS OFFERS GRANTS

Research projects to aid children and adults crippled by cerebral palsy, neuromuscular diseases, paralysis and hearing losses and another to promote educational opportunities for them will be furthered by a new series of grants awarded by the Easter Seal Research Foundation.

Institutions receiving the new series of awards include:

American Academy for Cerebral Palsy

$2,500 to support a research conference on management in cerebral palsy planned by its Committee on Evaluation of Treatment to consider launching a study which would contribute to effectiveness of treatment of the crippling condition. The committee, chaired by William T. Green, M.D., Boston, Massachusetts, will conduct the conference at Princeton University in 1959. It will include representatives of the various "schools of therapy" now providing care to cerebral palsied persons.

University of Chicago, Department of Medicine, Section of Medical Psychology

$7,486.50 for conducting a study aimed at improving methods for evaluating mental and vocational educability of brain-injured children, including those with cerebral palsy. Directed by Ward C. Halstead, Ph.D., director of medical psychology, the project is titled "The Methodology for Objective Evaluation of Psychometrid and Biological Intelligence of Handicapped Children, Including Cerebral Palsy."

Eugene du Pont Memorial Hospital and Rehabilitation Center, Department of Physical Medicine and Rehabilitation, Wilmington, Delaware

$9,500 toward research for perfecting a lightweight mechanical hand to assist persons crippled by paralysis.

Northern Illinois University, Department of Speech

$2,500 to support the study, "A Comparative Analysis of the Language Development of Normal and Hard of Hearing Children," conducted by Louis Lerea, Ph.D., director of the speech and hearing clinic.

University of Tennessee College of Medicine, Division of Pediatrics

$4,668.29 toward research that may contribute to treatment of neuromuscular diseases. James N. Etteldorf, M.D., professor of pediatrics, and Harris L. Smith, M.D., instructor of pediatrics, are studying why and how metabolism of skeletal muscles is affected in these various diseases.

Western Interstate Commission for Higher Education, Boulder, Colorado

$7,500 to provide information toward planning for efficient expansion and improvement in training programs for special education teachers in the nation's West.



he deserves

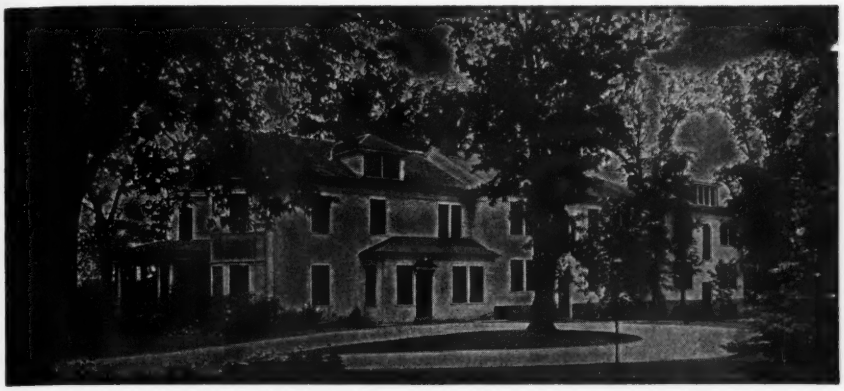
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A MODERN PRIVATE SANITARIUM

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MAIN BUILDING—One of 8 Units in "Cottage Plan"

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Located on beautiful Lake St. Croix, 18 miles from the Twin Cities, it has the advantages of both City and Country. Every facility for treatment provided, including recreational activities and occupational-therapy under trained personnel. Close personal supervision given patients, and modern methods of therapy employed. Inspection and cooperation by reputable physicians invited. Rates very reasonable. Special rates given to custodial patients.

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Woman's Auxiliary

AMA AUXILIARY MEETING ACTIVITIES HIGHLIGHTED

The thirty-sixth annual convention of the Woman's Auxiliary to the American Medical Association was formally called to order Tuesday, June 9, at 9:00 a.m. in the Vernon Room, Haddon Hall Hotel, Atlantic City, New Jersey. The meeting was opened by Mrs. E. Arthur Underwood, AMA Auxiliary President.

Included in the first day's activities was an address by Lt. Col. Ingalls H. Simmons, M.C. Colonel Simmons mentioned that turning a can of tomatoes or a box of crackers upside down and opening the end that sat on the shelf may save your life.

In the event of a thermonuclear attack, the Army physician warned never to take chances with food and water. "Radioactive fall-out material is just like dust," said Colonel Simmons, "the main problem is to keep fall-out from getting into your stomach where it can really do damage." Listing water, food and shelter as the three considerations that should be uppermost in the housewife's mind in disaster preparation, Colonel Simmons gave examples of safe emergency supplies and outlined steps to follow to keep the home as safe as possible.

Aubrey Gates, Director of the AMA Field Service, spoke on the subject, "Talking to Congressmen Back Home," at a luncheon honoring Woman's Auxiliary past presidents, and Dr. George M. Fister, Chairman of the AMA Council on Legislative Activities, was a guest speaker during an afternoon presentation on legislation.

Leading off the opening business sessions were Frank R. Burrows, Jr., Field Service Director of Chicago Citizens Traffic Safety, and Dr. Marvin A. Block of Buffalo, New York, Chairman of the AMA Committee on Alcoholism.

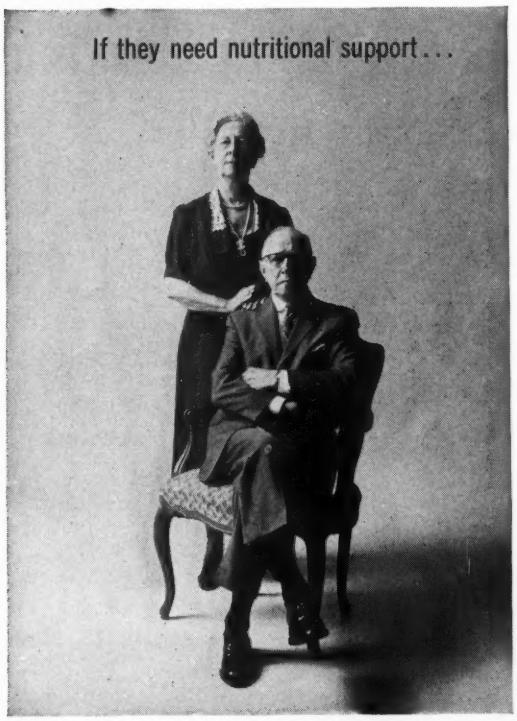
Dr. Gunnar Gundersen, immediate past AMA president, was the featured speaker at a luncheon honoring the retiring Auxiliary president, Mrs. E. Arthur Underwood, and the incoming president, Mrs. Frank Gastineau. Dr. Gundersen outlined the role of international medicine as an agent for peace.

Several films on medical recruitment and "Crusade for Freedom" were also shown.

Invocation was given by Rabbi Martin Weitz, Beth Israel Temple, Atlantic City. Greetings were given by Dr. David B. Allman, Chairman of the AMA Committee on Arrangements, and Dr. Louis Rosenberg, president, Atlantic County Medical Society.

Mrs. A. Guy Campo, president of the Woman's Auxi-

(Continued on Page 1130)



they deserve

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re-evaluating tranquilizers?

READ WHAT CLINICIANS ARE NOW SAYING ABOUT ATARAX®

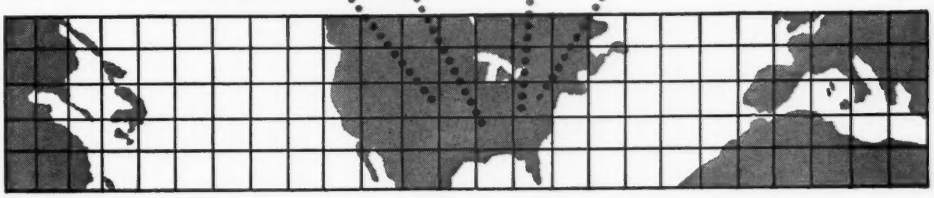
(brand of hydroxyzine)

IN GERIATRICS
"ability to decide correctly has increased, while the illogical response to anxiety has diminished."[1]

IN WORKING ADULTS
"especially well suited for ambulatory patients who must work, drive a car, or operate machinery."[3]

IN PEDIATRICS
"ATARAX appeared to reduce anxiety and restlessness, improve sleep patterns and make the child more amenable to the development of new patterns of behavior. . . ."[2]

IN GENERAL
ATARAX is "effective in controlling tension and anxiety. . . . Its safety makes it an excellent drug for out-patient use in office practice."[4]



INVESTIGATORS AGREE ON OPTIMAL ATARAX DOSAGES

For childhood behavior disorders	10 mg. tablets	3-6 years, one tablet t.i.d. over 6 years, two tablets t.i.d.
	Syrup	3-6 years, one tsp. t.i.d. over 6 years, two tsp. t.i.d.
For adult tension and anxiety	25 mg. tablets	one tablet q.i.d.
	Syrup	one tbsp. q.i.d.
For severe emotional disturbances	100 mg. tablets	one tablet t.i.d.
For adult psychiatric and emotional emergencies	Parenteral Solution	25-50 mg. (1-2 cc.) intramuscularly, 3-4 times daily, at 4-hour intervals. Dosage for children under 12 not established.

Supplied: Tablets, bottles of 100. Syrup, pint bottles. Parenteral Solution, 10 cc. multiple-dose vials.

References: 1. Smigel, J. O., et al.: J. Am. Ger. Soc., in press. 2. Freedman, A. M.: Pediat. Clin. North America 5:573 (Aug.) 1958. 3. Ayd, F. J., Jr.: New York J. Med. 57:1742 (May 15) 1957. 4. Menger, H. C.: New York J. Med. 58:1684 (May 15) 1958. 5. Coirault, M., et al.: Presse méd. 64:2239 (Dec. 26) 1956. 6. Bayart, J.: Presented at the International Congress of Pediatrics, Copenhagen, Denmark, July 22-27, 1956.

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Science for the World's Well-Being

(Continued from Page 1128)

liary to the Medical Society of New Jersey, gave the address of welcome, and Mrs. Clarence Lyon, president of the Woman's Auxiliary to the Washington State Medical Association, gave the response.

Auxiliary Presents American Medical Education Foundation Gift

Medical education got a financial boost from the physicians' wives who make up the Woman's Auxiliary to the AMA.

A check for $137,291 was presented to the American Medical Education Foundation by Mrs. Karl F. Ritter, Auxiliary AMEF Chairman. Dr. George F. Lull, president of the Foundation, accepted the check.

The presentations were made at the luncheon in Haddon Hall honoring Mrs. E. Arthur Underwood, retiring Auxiliary president, and Mrs. Frank Gastineau, the new Auxiliary head.

Program events included presentation of AMEF awards by Dr. Lull to Auxiliaries that chalked up impressive records last year, and presentation of *Today's Health* subscription contest awards by Robert Enlow, circulation manager.

At a morning general meeting for members only, election of officers took place. Informal discussion of 1959-60 committee programs by the Board of Directors and national committee chairmen were slated for the afternoon.

Officers Named

Mrs. William Mackersie, Detroit, Michigan, was named president-elect of the Woman's Auxiliary to the American Medical Association, and Mrs. Frank Gastineau, Indianapolis, Indiana, took office as president.

In elections at the concluding business session at Haddon Hall, the Auxiliary also elected the following officers:

First Vice President, Mrs. Charles L. Goodhand, Parkersburg, West Virginia; Eastern Regional Vice President, Mrs. Paul E. Rauschenbach, Patterson, New Jersey; North Central Vice President, Mrs. Stephen Bachelle, Enderlin, North Dakota; Southern Regional Vice President, Mrs. Willis G. Thuss, Birmingham, Alabama; and Western Regional Vice President, Mrs. L. D. Jacobson, Eugene, Oregon.

Constitutional Secretary, Mrs. W. W. Hubbard, Nashville, Tennessee; Treasurer, Mrs. Harlan English, Danville, Illinois; Director (two years) Mrs. Roger A. Cheney, Springfield, Massachusetts; Director (two years) Mrs. Albert E. Goldstein, Baltimore; Director (two years) Mrs. Stanley R. Truman, Oakland, California.

Director (one year) Mrs. E. Arthur Underwood, Vancouver, Washington; Director (one year) Mrs. Shelley C. Davis, Atlanta, Georgia; Director (one year) Mrs. William H. Evans, Youngstown, Ohio; and Director (one year) Mrs. M. A. Gold, Butte, Montana.

Finance Secretary, Mrs. Harry F. Pohlmann, Middletown, New York; Historian, Mrs. George Turner, El Paso, Texas; and Parliamentarian, Mrs. Mason G. Lawson, Little Rock, Arkansas.



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Vitamin A	5,000 U.S.P. Units
Vitamin D	500 U.S.P. Units
Vitamin B_{12} with AUTRINIC® Intrinsic Factor Concentrate	1/15 U.S.P. Oral Unit
Thiamine Mononitrate (B_1)	5 mg.
Riboflavin (B_2)	5 mg.
Niacinamide	15 mg.
Folic Acid	1 mg.
Pyridoxine HCl (B_6)	0.5 mg.
Ca Pantothenate	5 mg.
Choline Bitartrate	50 mg.
Inositol	50 mg.
Ascorbic Acid (C)	50 mg.
Vitamin E (as tocopheryl acetates)	10 I.U.
l-Lysine Monohydrochloride	25 mg.
Rutin	25 mg.
Ferrous Fumarate	30 mg.
Iron (as Fumarate)	10 mg.
Iodine (as KI)	0.1 mg.
Calcium (as $CaHPO_4$)	157 mg.
Phosphorus (as $CaHPO_4$)	122 mg.
Boron (as $Na_2B_4O_7.10H_2O$)	0.1 mg.
Copper (as CuO)	1 mg.
Fluorine (as CaF_2)	0.1 mg.
Manganese (as MnO_2)	1 mg.
Magnesium (as MgO)	1 mg.
Potassium (as K_2SO_4)	5 mg.
Zinc (as ZnO)	0.5 mg.

LEDERLE LABORATORIES, a Division of AMERICAN CYANAMID COMPANY, Pearl River, New York

For arthritic M.S.: full corticosteroid benefits from new Gammacorten T.M.



Patient M.S., 81, at the time of the first visit was in severe pain and very uncomfortable. Complained of swelling of wrists, legs and various joints; pain and stiffness in cervical area and lower spine; pain, swelling and limited motion in the fingers; slight ulnar deviation of the hand. M.S. demonstrates position necessary to put on his hat (motion was so restricted that he could not comb his hair).

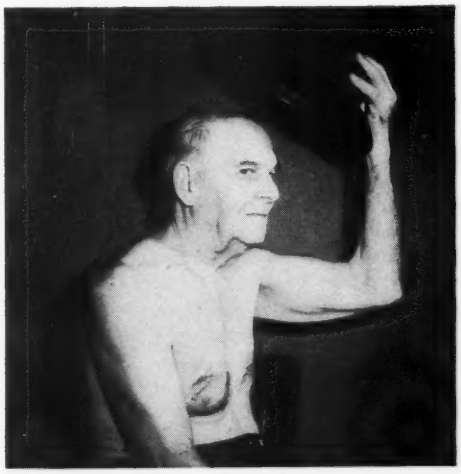
Treatment and Result: After 36 hours of GAMMACORTEN therapy, M.S. had "complete relief." Joint swelling had decreased, pain was almost absent, range of motion had increased dramatically. At the end of the first week of GAMMACORTEN he was free of discomfort and able to return to his job as a porter. M.S. could put on his hat normally, could comb hair; joint function near-normal after first week.

Gammacorten T.M.
(dexamethasone CIBA)

- potent, effective corticosteroid
- profound anti-inflammatory activity
- minimal side effects

From the files of a practicing physician. Photographs used with permission of the patient.

SUPPLIED: GAMMACORTEN Tablets, 0.75 mg. (pink, scored).



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The Physician's Diary

All officers of the Hennepin County Tuberculosis Association were re-elected for another term. Included are: **Dr. H. E. Drill,** president, and **Dr. Sumner S. Cohen,** first vice president.

* * *

Principal speaker for the ground-breaking ceremony of the new hospital in Aurora was **Dr. Richard Bardon,** of the Duluth Clinic, and president of the St. Louis County Medical Society. Dr. Bardon was introduced by **Dr. Richard Barnes** of the East Range Clinic in Biwabik.

* * *

Dr. Cleon R. Holland, of the Mayo Clinic, has left Rochester to practice medicine in Plainview.

* * *

Owners of the first medical building to be erected in Doctor's Park, Chaska, are **Dr. C. R. Heinzerling,** Chaska physician, and Dr. Edgar E. Ziegler, Chaska dentist.

* * *

Dr. Harry Burich, Rochester, recently attended a postgraduate course for surgical specialists in Kansas City, Missouri.

* * *

The member of Congress from Minnesota's Fifth Congressional District in Minneapolis, **Dr. Walter H. Judd,** has been re-appointed to serve on the Advisory Council of the United States Committee for the United Nations.

* * *

Blue Earth physician, **Dr. Bruce Sundberg,** has left that city for a practice in Heron Lake. Dr. Sundberg will be associated with **Dr. Gerald Kuss,** a former classmate who was with the U. S. Public Health Service in New York.

* * *

A former member of the Blue Earth Medical Center has returned to practice there. **Dr. Don V. Smith,** formerly surgeon with the center, will return there shortly to fill the vacancy left when Dr. Bruce Sundberg moved to Heron Lake.

* * *

A Mayo Clinic consultant, **Dr. Edward B. Waldmann,** has left Rochester to enter private practice in Phoenix, Arizona. Dr. Waldmann joined two other former Rochester doctors in Phoenix.

* * *

Wadena physician, **Dr. Luther Davis,** has announced that **Dr. Duane Ness,** Minneapolis, will be associated with the Davis Clinic in the near future.

* * *

Among six physicians recently named as consultants of the Mayo Clinic are **Dr. Philip J. Osmundson** and **Dr. Juergen E. Thomas.** Dr. Osmundson will specialize in Internal Medicine and Dr. Thomas in Neurology.

* * *

Dr. A. J. Lehrer, has announced his association in the practice of medicine with **Dr. F. C. Westerman** of Montgomery.

The new staff member of the Mork Clinic, Anoka, is **Dr. Matthew D. Yelle,** a native of Pennsylvania.

* * *

Dr. R. H. Puumala and **Dr. Marie Bepko Puumala,** Cloquet, attended graduation ceremonies for Ricard Puumala and their daughter-in-law, Barbara Meyer Puumala, from the University of Minnesota. Dr. Ricard and Dr. Barbara began their internship at St. Luke's Hospital following graduation.

* * *

Janesville physician and surgeon, **Dr. M. Clifford Florine,** has returned to Gorgas Hospital, Balboa, Panama Canal Zone, where he will complete the final two years of his residency in internal medicine.

* * *

A spring refresher course, sponsored by the Southern Minnesota Chapter of the Minnesota Academy of General Practice, was held recently in Faribault. Included as speakers on the program were **Dr. Elmer Paulson,** who discussed "Nuclear Medicine"; and **Dr. Harold Ravits,** whose topic was "Common Skin Disorders."

* * *

Elected as new chief of the medical staff of the Winona General Hospital, is **Dr. Sidney O. Hughes.** Also elected were: **Dr. D. V. Boardman,** vice chief; **Dr. Daniel Degallier,** secretary; **Dr. P. A. Mattison,** chief of surgery; **Dr. Warren W. Haesly,** chief of medicine and **Dr. L. J. Wilson,** chief of obstetrics.

* * *

Mayo Clinic staff men who have been honored recently include **Dr. H. J. Moersch,** who received the annual Rudolf Schindler Award of the American Gastroscopic Society. The award was presented by **Dr. A. M. Olsen,** Rochester, in Atlantic City, N. J., at the annual meeting. **Dr. E. A. Banner** was elected to the Executive Board of the Continental Gynecological Society in Kansas City. **Dr. R. B. Wilson** spoke at the recent Third World Congress on Fertility and Sterility of the International Fertility Association held in Amsterdam, Holland.

* * *

Dr. George Logan, Rochester, recently presided at a special committee meeting to work on a plan for a statewide school health council. Dr. Logan named **Dr. A. B. Rosenfield** as chairman of a subcommittee to draft a proposed charter for submission to interested agencies.

* * *

The superintendent of Cambridge State School has resigned his post to take another position in Tennessee. **Dr. George L. Wadsworth** will become superintendent of Clover Bottom home at Nashville and will also become director of research in a new research facility at Clover Bottom. Dr. Wadsworth will be succeeded at Cambridge by **Dr. Galen Adkins,** former superintendent of Sandstone State Hospital.



For Quality without Question... Enjoy the unique refreshment of sparkling Coca-Cola

SIGN OF GOOD TASTE

Dr. S. Marx White, Minneapolis, has been awarded the Northwestern University Alumni Association's Merit Award. The presentation, "in recognition of worthy achievement which has reflected credit upon Northwestern University," was made by Dr. Edgar Swanson, chairman of the Achievement Committee. Dr. White is one of the founders of the Nicollet Clinic.

* * *

Dr. Jack Gardner, Ceylon, will join his father, **Dr. V. H. Gardner,** in the latter's medical practice in Fairmont, later this summer.

* * *

East Range Clinic member, **Dr. J. Raymond Chittum,** has left Hoyt Lakes for Niagara Falls, New York, where he has accepted a position.

* * *

Speaking recently at a dinner of the state division of vocational rehabilitation was **Dr. Frank Krusen,** of the Mayo Clinic, Rochester.

* * *

Physicians from fifteen Minnesota mental health and other institutions were recent participants in a quarterly conference at the Faribault State School and Hospital. Presiding at the conference was **Dr. Dale Cameron,** medical director of the Minnesota Department of Public Welfare.

* * *

It has been announced that **Dr. Walter A. Fansler,** Minneapolis, has been made an Honorary Member of the Royal Society of Medicine (Proctologic Section) at the joint meeting of the Royal Society of Medicine and the American Proctologic Society in London.

* * *

Dr. Albert Fritsche, New Ulm, has been elected president of the Union Hospital Board of Directors. He succeeds George D. Erickson.

* * *

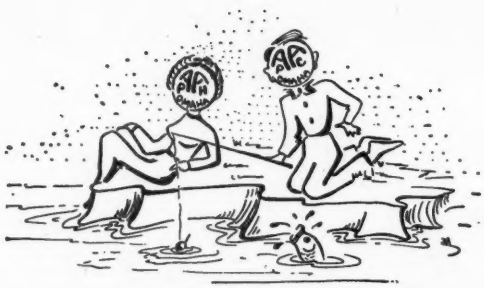
New member of the Willmar Clinic is **Dr. Harris P. Hinderaker,** formerly of Bird Island. Dr. Hinderaker is the seventh member of the medical staff at the clinic. Other members are **Drs. H. G. Bosland, W. E. Peterson, R. P. Michels, A. M. McCarthy, A. J. Ellinger, J. W. Docksey** and a dentist, Dr. J. J. Michels.

* * *

Among Mayo Clinic members appearing on programs in foreign countries recently are: **Dr. R. R. Kierland,** participant of the Fourth Congress of Dermatology in Lisbon-Coimbra, Portugal; **Dr. F. H. Krusen,** speaker at the Fourth Inter-American Rehabilitation Conference in San Juan, Puerto Rico; and **Dr. J. S. Lundy,** speaker at a meeting of the Ontario Medical Association in Toronto, Canada.

* * *

Dr. Donald Peterson, superintendent of Anoka State Hospital, has been honored with a certificate of appreciation from the Anoka Red Cross Chapter. Dr. Peterson's award was given for his activities in promoting the blood fund drive for that chapter.



Protection against loss of income from accident & sickness as well as hospital expense benefits for you and all your eligible dependents.

ALL PREMIUMS COME FROM — PHYSICIANS SURGEONS DENTISTS — ALL BENEFITS GO TO

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OMAHA 31, NEBRASKA
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Handsome Professional Appointment Book sent to you FREE upon request.

relief from all cold symptoms

Tussagesic®

decongestant, non-narcotic antitussive, analgetic, expectorant

Each timed-release tablet provides:

Triaminic® ..... 50 mg.
(phenylpropanolamine HCl.....25 mg.
pheniramine maleate .....12.5 mg.
pyrilamine maleate .....12.5 mg.)
Dormethan (brand of dextromethorphan HBr) ..... 30 mg.
Terpin hydrate .....180 mg.
APAP (N-acetyl-p-aminophenol) .....325 mg.

Dosage: One Tussagesic tablet in the morning, mid-afternoon and evening, if needed.

Also, for patients who prefer liquid medication: TUSSAGESIC SUSPENSION.

SMITH-DORSEY • Lincoln, Nebraska
a division of The Wander Company

Dr. George Logan, Rochester, has been named chairman of a special meeting of delegates from voluntary health agencies and state government agencies.

* * *

A symposium on diseases of the liver and bile passages was held recently in Fergus Falls. The event was sponsored by the medical staff of Lake Region Hospital and the Park Region District and County Medical Society. Speakers at the symposium included **Dr. Richard Varco,** University of Minnesota; Dr. Wm. Summerskill, Mayo Clinic; **Dr. George Hollenbeck,** Mayo Clinic; Dr. P. H. T. Thorlakson, University of Minnesota. **Dr. P. H. Rockwood,** president of Lake Region Hospital Medical staff presided at the morning session. **Dr. Henry Korda,** Pelican Rapids, presided at the afternoon session. Also taking part were **Dr. A. E. Sethre** and **Dr. Ward Shaver,** of Fergus Falls.

* * *

Dr. R. Drew Miller, Rochester, has been named assistant director of the Mayo Foundation for Medical Education and Research.

* * *

Floodwood physicians **Dr. Edward O. Jorgensen** and **Dr. James C. Trautmann** have ceased to maintain their Meadowlands office. They are continuing their practice in the Duluth office.

* * *

Dr. Norman B. Bloom, Minneapolis, was recently elected president of the Minnesota Chapter of the American Friends of the Hebrew University.

* * *

Belgrade physician, **Dr. Gene R. Savelkoul,** has purchased the Dr. G. F. Engstrom combination residence and medical clinic on Washburn Avenue. Dr. Savelkoul plans to continue his medical practice in the municipal building on the opposite side of the street, and will occupy the residence part of the building. The building was originally erected by **Dr. H. F. Slocumb** and was purchased by Dr. Engstrom in 1929.

* * *

Dr. C. Sherman Hoyt, who recently completed his specialties training in pediatrics at the Mayo Clinic, has joined Drs. Albert Schroeder, Hreidar Agustsson and Detlof Olson in the practice of pediatrics at 225 Southdale Medical Building, Minneapolis.

* * *

The Itasca Clinic was recently opened in Park Rapids by **Dr. Robert D. Schrantz** and **Dr. Everette J. Duthoy,** both of whom are new to Park Rapids.

* * *

Dr. Leo J. Furr, Bird Island, has announced his association with **Dr. George C. Bingham,** who has assumed partnership with Doctor Furr. Doctor Bingham formerly practiced in Chaska.

* * *

Dr. G. T. Midboe, Forest Lake, has announced that **Dr. Lawrence Purdie** is now associated with him in medical practice. Doctor Purdie has been medical officer in charge of the Cass Lake Indian Hospital in northern Minnesota for the past year.

Book Reviews

FUNDAMENTALS OF OTOLARYNGOLOGY. By Lawrence R. Boies, M.D., Professor of Otolaryngology, Chairman, Department of Otolaryngology, University of Minnesota Medical School. 510 Pages. Illus. 3rd Edition. Philadelphia: W. B. Saunders, 1959.

The latest edition of this work is the third, of which translations have now been made into Spanish and Italian. The first edition (443 pages) was published exactly ten years ago, in 1949; the second (487 pages) came out in 1954 and the third (510 pages) was published this year. This gradual enlargement permits expansion of the text where necessary and also the addition of four new chapters, one dealing with maxillofacial injuries, another with reconstructive surgery of the nose, a third with tumors and swellings of the neck, and a fourth with diseases of the salivary glands.

The author's associates, each responsible for one or more chapters, are Anderson C. Hilding, Jerome A. Hilger, Conrad J. Holmberg, Douglas R. Kusske, Robert E. Priest, George M. Tangen, and Harold S. Ulvestad. The first two editions were dedicated to Dr. Harris P. Mosher, whereas this one is dedicated to Dr. Harold S. Diehl, former dean of Medical Sciences at the University of Minnesota.

The book is intended as a guide to the teaching of medical students, and also as a handbook for the daily use of physicians in general practice. It fulfills both of these purposes admirably. Both the text and illustrations are clear and to the point.

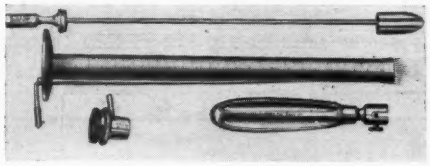
To this reviewer, who is a staunch believer in fundamentals, one of the best features of the volume is the inclusion of three chapters dealing in detail with the applied anatomy and physiology of the ear, the nose, and the throat. These are also extremely well written, and facilitate greatly the understanding of the text which follows.

The book fills an important place in the field of otolaryngology and is recommended to those who need help in this specialty.

VIRGIL J. SCHWARTZ, M.D.



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TABLE I. SCALES OF ENERGY EXPENDITURE

Activity	Cal./Min.
Sustained (8 hours)	
Rest	1.25
Light manufacturing	2.00
Steel mill (average)	2.50
Occasional jobs	up to 5.00
Excessive	over 5.00
Individual activities	
Light	up to 5.0
Moderately heavy	up to 7.5
Heavy	up to 10.0
Very heavy	over 10.0

Rehabilitation of the Cardiac Patient

Many aspects of the practice of medicine are aided by team effort. This report summarizes some of the earliest systematic studies of rehabilitation of the cardiac patient. Included are many practical suggestions as well as forthright statements of the philosophy and psychology of the care of the whole patient by the key man on the team—the private physician.

Presented at the Postgraduate Scientific Assembly sponsored by the Hennepin County Chapter, American Academy of General Practice, the Hennepin County Medical Society, and Lederle Laboratories, Minneapolis, January 12, 1959.

AMASA B. FORD, M.D.

Cleveland, Ohio

THE SUBJECT of this report is how to help people live with heart disease. I would like to start with a case history.

A fifty-four-year-old repairman suffered a myocardial infarction in March, 1956. After several weeks of hospitalization and progressively increasing activity he returned to his job repairing and maintaining road machinery, which he now does full-time without symptoms. Always a vigorous and hard-working man, he has gradually learned to let younger men help him with the heaviest work. Facing up to the fact that he cannot expect to do this type of work indefinitely, but knowing that he cannot tolerate inactivity, he has studied and obtained a license as a real estate salesman. He is gradually gaining experience in this new and less strenuous work and plans to change to it completely in the next year or two. When I talked to him recently, he said, referring to his heart attack, "That thing hit me an awful rap. Mom and Dr. Smith had their hands full for a while. When I woke up in the morning I'd say to myself, 'Well, I'm still alive today—I guess I'm going to die tomorrow.' But time went by, and I kept getting better, and I finally came to realize that when my time's going to come, it's going to come. There's no use worrying about it—you just have to go ahead and do the best you can."

That story describes the objective of cardiac rehabilitation in its simplest terms: To accept

and understand a serious disease state and to plan the most reasonable and full life possible within its limitations.

The general purpose of rehabilitation is no different from that of other forms of medical therapy. It has been called the "third phase of medical care" and "clinical after-care." The new element in the modern concept of rehabilitation is the recognition that interpersonal relations, emotional attitudes, and the social and economic environment may have as much to do with what an individual patient can achieve as the strictly medical aspects of his case. The President of the United States may survive a mild coronary occlusion at the age of sixty-five and return to work, but a sixty-five-year-old laborer in a steel mill, who recovers equally well from the same illness, cannot.

Rehabilitation of the patient with heart disease ideally takes place in four stages. First, the patient's medical problem is defined in detail. Second, trained health personnel in social work, vocational counseling and other fields are called upon when needed. Third, an orderly plan is made, and responsibility for carrying it out assigned. Finally, follow-up treatment and observation insure that the plan is carried through and adapted to changing events.

Defining the Medical Problem

The first step is evaluation. I don't intend to elaborate on diagnostic methods today except to say the obvious—that all subsequent stages of rehabilitation depend on an accurate diagnosis. It is often wise to defer advice and planning until laboratory tests, consultation, or time have clearly established the nature and extent of the heart disease or—and this is often important—its absence. Evaluation starts with a careful medical history and physical examination. The man with heart disease can often give a good description of his cardiac reserve by describing common activities which produce symptoms. These activities may be compared with the possible range of human activity and with the known energy requirements of work to determine safe levels of activity for the individual patient.

At rest, the adult human consumes about 250 cc. of oxygen a minute, which is equivalent to 1.25 large calories per minute. A champion athlete, using large muscle masses during sustained skiing or swimming for fifteen to thirty minutes, can expend 26 calories a minute, while the maximum energy expenditure for untrained young men running on a treadmill is about 14 calories a minute.[1] A group of German investigators measured the *maximum* energy expenditure of patients who had recovered from myocardial infarction and found them able to sustain an energy output of from 5 to 10 calories per minute.[2]

The energy cost of individual ordinary activities such as washing and dressing is in the range of 2 to 4 calories per minute.[3] Gardening, playing golf, or walking around the block requires 4 to 6 calories a minute, and cutting the grass, 5 to 7 calories a minute. I could hardly talk on this subject in Minnesota in January without mentioning snow shoveling, which can call for near-maximal exertion if the snow is wet and the shoveler eager. We must not forget the housewife, who can also expend a significant amount of energy in her work.

When we turn to the energy cost of work, individual activities are of importance when they exceed the tolerance of a worker with heart disease. Dr. Herman Hellerstein and I have made a series of observations on men with heart disease and control subjects at work in light metal manufacturing plants,[4] and we have subsequently expanded the study to include the more strenuous work performed in a steel mill.[5] We found two general patterns of energy expenditure. The desk or bench worker has a low, sustained level of energy expenditure with few peaks. Most modern factory workers, whether sedentary or standing at a lathe or automatic machine, exhibit a work pattern of this type. On the other hand, some jobs, particularly in the steel mill, show intermittent peaks of exertion like that of the fireman, but heavy work of this type is usually punctuated by frequent and often prolonged rest periods. The steel mill workers actually worked 55 per cent of the shift, while the men in the light metal manufacturing plants worked 65 per cent of the shift.

Peaks of exertion are important in making a work prescription for a cardiac patient, but we must also consider the sustained level of energy expenditure and its possible fatiguing effect. Average energy expenditure during the shift was low for those employed in light metal manufacturing—about 2 calories a minute—and rarely more than twice the resting rate. In the steel mill the average rates were higher; the men who tended the open hearth and blast furnaces averaged 3 calories a minute. Our studies show that the energy require-

ments of most modern industrial work are low and well within the capacity of many patients with heart disease. No difference in the rate or pattern of work could be demonstrated when the cardiac patients were compared with their healthy coworkers.

Work on the farm differs from factory work. The hours are longer, and certain tasks call for a greater expenditure of energy than all but the heaviest steel mill jobs. Because of the difference in work pattern on the farm, many farmers with heart disease reduce their activity as compared with healthy contemporaries.[6]

TABLE II. PREDOMINANT INFLUENCE OF EXTERNAL AND INTERNAL ENVIRONMENT ON PHYSIOLOGIC REACTIONS OF WORKERS IN A STEEL MILL

Physiologic Function	Predominant Influence			
	Exertion	Heat	Heart Disease	Anxiety
O_2 consumption	+			
Pulmonary ventilation	+			
Pulse	+	++	+	+
Blood pressure	+		+	
Electrocardiogram			+	

To summarize these remarks, Table I shows two scales of energy expenditure. Five calories a minute is the upper limit of sustained energy expenditure during daily work which can be tolerated by healthy men. This tolerance limit was proposed by German physiologists, and our studies tend to confirm it. The two most demanding jobs in the steel mill required an average energy expenditure of 4.25 and 4.75 calories per minute for the shift. The average sustained energy expenditure for most workers in a modern American factory is less than half this maximum. We believe that all Class II and many Class III cardiac patients can safely work at this level, that is, 2 to 2.5 calories a minute.

With regard to individual activities, a simple standard of comparison available to the physician is the Master two-step test. This exertion is equivalent to climbing and descending two flights of stairs in a minute and a half. The energy cost of the two-step test, as measured in our laboratory, is 8.5 calories a minute which would rate as heavy exertion on the scale.[7] A patient who can perform this test without abnormal changes in blood pressure, pulse rate or electrocardiogram should be able to perform safely most ordinary industrial tasks except for the heaviest type of manual labor. Most jobs which involve activities calling for more than 7 to 8 calories a minute can readily be modified to avoid such occasional exertions. If a patient can climb and descend two flights of stairs at an ordinary pace, he can do most industrial jobs equally safely.

TABLE III. "HEART WORK" AND ENERGY EXPENDITURE OF A STEELWORKER AND A SURGEON

	Energy Expenditure (Cal./Min.)	Working Increase In				
		Systolic BP (mm. Hg)		Pulse Rate (Beats/Min.)		"Heart Work"
Steelworker	4.4	10	×	61	=	6'0
Surgeon	3.0	80	×	35	=	2800

Total body energy expenditure, however, is only one of several stresses which determine the load on the cardiovascular system. Table II summarizes the conditions which we have found to have the greatest influence on certain physiologic functions. Oxygen consumption and pulmonary ventilation depend primarily on energy expenditure. Pulse rate is influenced by several factors, the most significant of which, in the steel mill, is heat stress. Marked increases in blood pressure and abnormal electrocardiographic changes, on the other hand, were observed mainly in individuals with known heart disease.

Recent studies at the National Institutes of Health indicate that the work of the heart, as measured by myocardial oxygen consumption, is closely correlated with blood pressure and heart rate. In studies on dogs, this correlation was demonstrated between myocardial oxygen consumption and the product of peak systolic blood pressure and heart rate.[8,9] We have observed increases of blood pressure and heart rate in certain surgeons at the operating table, where energy expenditure is generally low, which exceed the physiologic changes in the steel workers (Table III). If the product of heart rate and systolic blood pressure can be taken as a rough index of the work of the heart, it appears that it is possible for a surgeon working at an energy expenditure 30 per cent *less* than a steelworker to have an increase in heart work four or five times *greater*.

Data on energy expenditure, therefore, can serve to quantify one, but only one, of the major stresses which influence the cardiovascular system. A man with heart disease may or may not respond in an abnormal way to a given level of energy expenditure. Individual study of a man or woman with

heart disease remains the best way to determine his or her capacity to do the job. The patient's response to measured exercise in terms of blood pressure, pulse rate, and electrocardiographic changes can give important information and can be measured. Other physiologic changes, such as the output of adrenal hormones, epinephrine, and norepinephrine, and indirect effects on lipid metabolism may be of equal importance. We are just beginning to be able to measure some of these changes. Above all, we are just beginning to recognize that the changes in the body which condition health or disease are determined as much by what the job means to the workman as by how much energy it requires.

Social Evaluation

Standard clinical diagnostic methods and tests of function form the basis for definition of the problem. But for effective rehabilitation, the patient must also be studied in the light of his emotional and social characteristics. Traditionally, the small town family doctor has a profound knowledge of his patient's personality and social background as well as his medical condition. In a large city, however, the doctor, who may have specialized medical training and be able to provide effective forms of treatment, nevertheless lacks information about the patient's life outside of the office or hospital. The importance of such information has been so well expressed by Francis Peabody in his essay on "The Care of the Patient"[10] that I would like to quote what he says:

> Everybody, sick or well, is affected in one way or another, consciously or subconsciously, by the material and spiritual forces that bear on his life, and especially to the sick such forces may act as powerful stimulants or depressants. When the general practitioner goes into the home of a patient, he may know the whole background of the family life from past experience; but even when he comes as a stranger he has every opportunity to find out what manner of man his patient is, and what kind of circumstances makes his life. He gets a hint of financial anxiety or of domestic incompatibility; he may find himself confronted by a querulous, exacting, self-centered patient, or by a gentle invalid overawed by a dominating family; and as he appreciates how these circumstances are reacting on the patient he dispenses sympathy, encouragement, or discipline. What is spoken of as a "clinical picture" is not just a photograph of a man sick in bed; it is an impressionistic painting of the patient surrounded by his home, his work, his relations, his friends, his joys, sorrows, hopes, and fears.

Some of this information may be thrust upon the doctor by a fearful patient, some lies ready to the observant eye, but to get at certain serious troubles requires much time, patience, and skilled interviewing technique for which the busy practitioner or industrial physician has little time. Fortunately, consultants trained not only in the medical specialties but also in psychiatry, social work and vocational counseling are becoming increasingly available to the doctor and his patient with heart disease.

The second stage of rehabilitation has been greatly facilitated in the past seventeen years by the development of work classification clinics in major industrial centers throughout the country. These clinics, established and financed in various ways, are available to patients who have or are suspected to have heart disease and for whom a work prescription is needed. A work classification clinic, organized under the direction of Dr. Arthur Kerkhof, was recently opened in Minneapolis. I would like to describe to you the method of operation, and, later, summarize the experience of the Cleveland Work Classification Clinic which has been operating successfully under the direction of Dr. Hellerstein since 1950, because a new venture of this sort naturally raises many questions.

At the work classification clinic, the patient, who may be referred by any physician, undergoes a complete medical examination and is interviewed individually by members of a team. The team usually includes, in addition to a cardiologist, a social worker, a vocational counselor, a nurse, and sometimes other consultants such as a psychiatrist or a psychologist. Meeting in a round-table discussion, the team members then outline the patient's problem and draw up recommendations for work, activity, retraining, or further medical study and treatment. These recommendations are explained to the patient at a second interview and reported in detail to the referring physician. The work classification clinic, we believe, is an effective device to bring the skills of several disciplines to bear at one time on the problems of a patient with heart disease. But the use of a team approach to cardiac rehabilitation need not be confined to such clinics.

The ultimate responsibility for the patient's welfare remains in the hands of his physician. About three-quarters of the patients with heart disease can be successfully managed by their private physicians. But the physician is never alone in this undertaking. The middle-aged business-

man, flat on his back in the hospital with a "coronary," embodies the problems of cardiac rehabilitation and needs help with them long before he can attend a clinic. Everyone who enters his room participates in his care, whether consciously or not, and the skilled clinician begins to enlist the help of as many of these potential allies as possible from the first day of illness. Professional help is readily available in most hospitals from the nurse, the social worker, and the dietician. But all their efforts may be vain unless the patient's wife and children are given a sympathetic explanation of what is wrong, what the real dangers and hopeful prognostic signs are, and how important their attitudes and actions can be. The family, with the doctor, furnish the thread of continuity when the patient exchanges the strange and threatening hospital environment for that of his home and, later, when he makes his first ventures back into the world of normal activity.

Individual consultants may make important contributions to the management of patients with heart disease. Fifty-one per cent of the first 460 patients seen at the Cleveland Work Classification Clinic were judged to exhibit anxiety out of proportion to their medical condition, and 60 per cent had difficulty accepting their illness emotionally and intellectually. Adequate help in dealing with these problems can be provided by an attentive physician, but in occasional cases psychiatric treatment is required. The help of social workers, vocational counselors and others may be obtained by individual referral. A telephone call to the industrial physician or personnel manager may prevent misunderstanding on both sides. But in general, this type of piecemeal planning and consultation is less effective than a combined evaluation made during a face-to-face discussion, and leading to an integrated plan.

The Orderly Plan

The third aspect of cardiac rehabilitation is the making of an orderly plan. A patient with heart disease is always "managed," whether a plan exists or not. He may be held back by fear of activity, he may drift into self-pity and chronic disability because no one seems to care about the problem that threatens to overwhelm him, or he may be driven to exhaustion by a job for which he is ill-adapted. Chance circumstances, casual advice, or misinformation will "manage" the patient if the doctor doesn't. Again, the man ultimately responsible is the family doctor. The most careful team evaluation and planning may be ineffective unless it is clearly conveyed to the doctor. The plan must make sense to him and result in clear advice and orderly treatment.

The type of plan will be determined by the pattern of disease and modified by individual factors. The patient with rheumatic heart disease faces adjustment to a life-long and slowly progressive disability punctuated by episodes of heart failure or recurrent rheumatic fever. A reasonable plan for him may include retraining in a low-energy, highly skilled job which he can continue to hold during years of decreasing functional capacity. Surgical treatment at an appropriate time may be indicated and will certainly require emotional preparation and financial planning. An important part of the plan for many rheumatic patients is regular antibiotic prophylaxis against streptococcal infection.

The middle-aged man who suddenly develops the symptoms of coronary artery disease, on the other hand, needs help in dealing with abrupt, often apparently catastrophic, new factors in his life. He needs information and the reassurance that new knowledge of heart disease makes possible a more favorable prognosis. A plan for such a patient takes the form of a stepwise progression back to normal living, including medical treatment, dietary planning, evaluation of functional capacity at various stages, and vocational readjustment.

Follow-up

The fourth stage of cardiac rehabilitation, and in many ways the most important, is long-term consistent follow-up with periodic re-evaluation and adjustment of the plan to changing conditions. Again, the private physician remains the central figure. His task can be easier if he knows what to expect. Members of the staff at the Cleveland Work Classification Clinic have recently completed a follow-up analysis of the first 460 patients seen at the clinic.[11] These data represent the longest and most complete study of patients with heart disease referred for work evaluation. Because of the importance of such information in the rehabilitation of the cardiac worker, I would like to summarize the results briefly for you.

Of the first 460 patients, follow-up information was obtained on 433 (94 per cent), and the average follow-up was six years (range 4.6 to 7.8

years). The diseases seen most frequently were arteriosclerotic heart disease, hypertensive cardiovascular disease and a combination of the two. These three categories included 60 per cent of the patients. Twenty per cent had rheumatic heart disease. The patients were classified according to the Functional and Therapeutic Classification of the New York State Heart Association. A striking finding was that this rough clinical classification had prognostic value. Six-year survival rates were: Class I, 83 per cent; Class II, 61 per cent; Class III, 40 per cent; Class IV, 34 per cent. Other initial findings associated with a high mortality rate were an abnormal response to the Master two-step test (twice the mortality rate of those with normal responses), and a diastolic blood pressure above 120 mm. Hg (twice the mortality rate of those with diastolic pressures below 100 mm. Hg).

The patients were mainly white men (90 per cent), and they came to the clinic for advice regarding work or activity. Fifty-eight per cent were not working at the time of their first visit. The majority (54 per cent) were judged capable of returning to their previous job or to more strenuous work. Twenty-nine per cent were advised to do lighter work, 10 per cent needed evaluation of work tolerance, 19 per cent, further treatment, and 7 per cent were rated unemployable. (I might comment that more than one of the recommendations listed were made in some cases). The over-all work record at follow-up was good. Eighty-two per cent of the patients worked part or all of the period between first visit and follow-up or death. The most important factor interfering with work was heart disease, but those remaining employed lost only 3.8 days per 100 days for cardiac reasons and 1.9 days per 100 days for non-cardiac reasons, compared with a reported average of 3.4 days per 100 days' absenteeism for unselected workers. Education beyond grade school was associated with a better employment history. The soundness of the team approach to work evaluation was borne out by the fact that of those initially advised to continue or increase their work, 80 per cent were found to be employed at follow-up, whereas only one out of seven rated unemployable had been able to find work. Sixteen of the twenty patients referred for further vocational evaluation and training were working at the time of follow-up.

We believe that the experience of the Cleveland Work Classification Clinic demonstrates that consistent application of the principles of rehabilitation can result in sound planning and satisfactory work adjustment for the majority of patients, without ignoring the serious nature and far-reaching consequences of heart disease.

Joseph Fox, in his recent book, *The Chronically Ill,* [12] says:

> The story of man's response to the challenge of physical misfortune is really a universal one, and it is a thrilling story. Many responses to this challenge have been heroic; and many have been full of humanity, humor, resourcefulness and great courage and perseverance. It has not been all suffering. Much of it has shown the victory of man's spirit, which is the essence of life itself.

I would like to close by wishing success to your new work classification clinic and to encourage those of you in the audience who practice in the vicinity to make use of its facilities in planning for your patients with heart disease.

References

1. Taylor, H. L., Buskirk, E., and Henschel, A.: Maximal oxygen intake as objective measure of cardio-respiratory performance. J. Appl. Physiol., 8:73, 1955.
2. Bolt, Von W., Balodimos, J., Kann, J., Valentin, H., and Venrath, H.: Zur Beurteilung der Leistungsfähigkeit von Patienten mit Zustand nach Herzinfarkt. Ztschr. Kreislaufforsch., 46:284, 1957.
3. Passmore, R., and Durnin, J. V. G. A.: Human energy expenditure. Physiol. Rev., 35:801, 1955.
4. Ford, A. B., and Hellerstein, H. K.: Work and heart disease: I. A physiologic study in the factory. Circulation, 18:823, 1958.
5. Ford, A. B., and Hellerstein, H. K.: Work and heart disease: II. A physiologic study in a steel mill (in press).
6. Purdue Farm Cardiac Seminar, September 10-11, 1958, Purdue University, Lafayette, Indiana (proceedings in press).
7. Ford, A. B., and Hellerstein, H. K.: Energy cost of the Master two-step test. J.A.M.A., 164:1868, 1957.
8. Braunwald, E., Sarnoff, S. J., Case, R. B., Stainsby, W. N., and Welch, G. H., Jr.: Hemodynamic determinants of coronary flow: Effect of changes in aortic pressure and cardiac output on the relationship between myocardial oxygen consumption and coronary flow. Am. J. Physiol., 192:157, 1958.
9. Cooper, T., Braunwald, E., and Morrow, A. G.: Pulsus alternans in aortic stenosis: Hemodynamic observations in 50 patients studied by left heart catheterization. Circulation, 18:64, 1958.
10. Peabody, F. W.: Doctor and Patient. New York: MacMillan, 1930.
11. Turell, D. J., and Hellerstein, H. K.: Six-year average follow-up of 460 consecutive cardiac patients. Circulation, 18:790, 1958 (abstract). Full report in preparation.
12. Fox, J.: The Chronically Ill. New York: Philosophical Library, 1957.

Fractures among Children

I. Parental Assault as Causative Agent

Presented before the Clinical Meeting, American Medical Association, Minneapolis, December 3, 1958.

DONALD S. MILLER, M.D., Ph.D.
Chicago, Illinois

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FRACTURES from parental assault have received only scattered recognition of what they actually represent: deliberate or careless trauma inflicted on children by delinquent adults. Caffey[1] and Silverman[2] have surmised the origin of injuries among children from this type of traumatic experience but Caffey, so far as I know, has not submitted his supposition in print. Silverman has been emphatic about it. An excellent critical review and comprehending analytic study of the etiologic problem was made in 1955 by Woolley and Evans[3] of Detroit. Their study covered cases of bone lesions found in many children, among whom twelve met their criteria of belonging to "injury-prone environments," environments in which at least one adult was psychotic or neurotic and in which every household was unstable in one manner or another. The children had had multiple areas of injury to bone, cumulative over a prolonged period, in conjunction with injuries to other tissues. Woolley and Evans cogently refuted Astley's deduction regarding fragility of the metaphyseal bones of infants which Astley saw as the common denominator pointing to causation, notwithstanding the concurrence in his cases of "bruising, retinal separation, compression of vertebrae, and multiple (ordinary) fractures."

Bakwin[5] likewise doubts Astley's fragility hypothesis "in view of the normal appearance of the unaffected bones, the smooth healing process and the normal subsequent development of these children . . . [with] subperiosteal ossification, metaphyseal fractures, avulsions, gross fractures, impacted fractures, and epiphyseal displacements"—all of traumatic origin, deliberate or through neglect, without a doubt when the accompanying circumstances are taken into account. Jones and Davis[6] summarized thirty-seven reported cases of "multiple traumatic lesions of the infant skeleton" and added descriptions of five of their own cases, in which they also urged the initial provisional diagnosis of traumatic experience when clinically collateral symptoms are suggestive, rather than to assume an underlying disease, perhaps of obscure etiology.

Congenital or acquired underlying diseases of children which lead to pathologic disturbances of bone are not too mysterious to identify. The likeliest of these are scurvy, rickets, syphilis, tuberculosis, malignancies, and some of the blood dyscrasias, such as leukemia, Letterer-Siwe disease and Cooley's anemia. Fractures of clinically uncertain origin among children have often been presumed to be the result of scurvy, rickets, or syphilis; but these are now rare diseases of children, although the possibility, particularly regarding scurvy, among these three conditions, may not be dismissed in differential diagnosis when the cause cannot be established by the history. As Silverman[2] pointed out, it is noncontributory and naïve to make extensive laboratory studies when the cause is obvious. Biochemical testing to disclose the reason for bruising, hemorrhages, ecchymoses, and fractures on the presumption that they are of

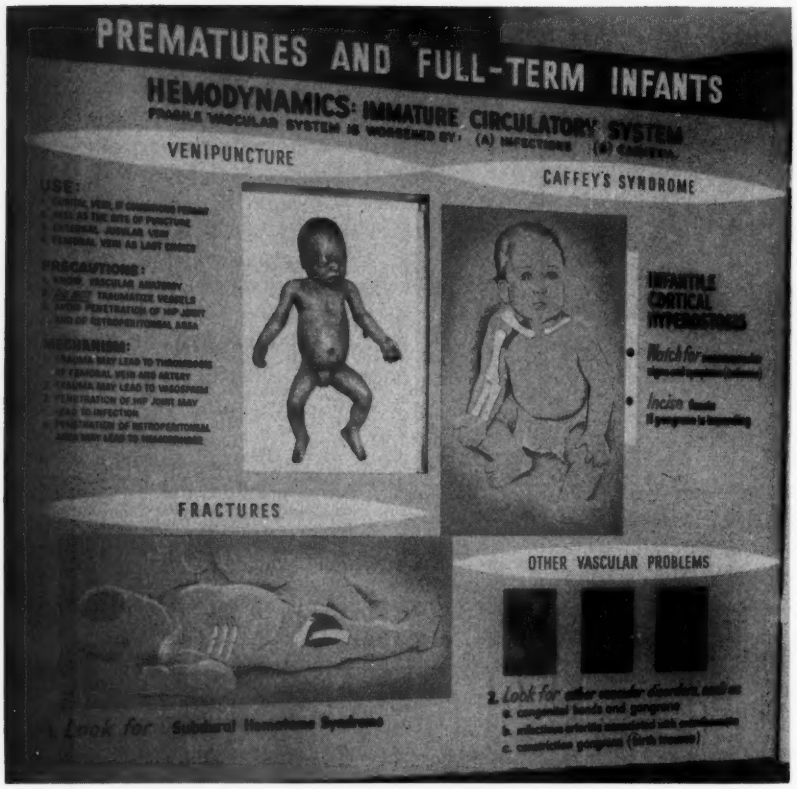


Fig. 1. Circulatory changes associated with orthopedic disorders. Note subdural hematoma syndrome and infantile cortical hyperostosis (Caffey's syndromes).
From exhibit of Circulatory System Changes Associated with Orthopedic Conditions prepared by the author and Rowlin Lichter, M.D.

pathologic origin is wasteful when the cause is plain at the outset to the alert examiner.

Regarding Caffey's syndrome, I believe that subdural hematoma (Fig. 1) is certainly of traumatic origin. Infantile or congenital cortical hyperostosis (Fig. 1) may be confused with traumatic periostitis unless history-taking is thorough. Friedman[7] has called attention to the resemblance between the two conditions.

When maltreated children are tended in the hospital, they gain weight rapidly, because they eat ravenously—evidence of previous neglect as the cause of malnourishment and nutritional anemia, which are almost always conditions concomitant with the fractures and bruises. When such children are removed from harmful environment, new lesions do not appear and the old ones heal uneventfully.

On November 10, 1958, the newspapers carried the story of an 18-month-old child who was slapped by his father for bed wetting and became paralyzed on the right side. The hospital diagnosis was said to be a brain hemorrhage. The father insisted that his "slap did not do it" but that the child who was just learning to walk had fallen in the kitchen "and got a big lump above his nose," as the man put it. But there were bruises reported over other areas of the face and on the hands. On November 21, 1958, a headline in the Chicago *Daily News* read, "Parents Get Life in Baby's Death." The child, who had been beaten by an Indiana couple who testified that they "didn't like girls," died of a broken arm, skull fracture, and severe burns and bruises over the body. And another infant daughter, according to the story, died of malnutrition several years ago. These are extreme examples that make the headlines. What about the less severe cases that go undetected?

Because general practitioners treat 60 per cent of the simple fractures, they must be quick to iden-

tify the presenting appearance of strange multiple associated injuries. *Suggestive lesions should make parents suspect*—or their baby sitters or their older siblings or, as social workers' case studies show, the lovers of irresponsible guardians who maltreat the children when children discover their clandestine meetings or are otherwise in the way. The sociologic implications, then, as well as the needs and plan of treatment, require that the attending physician be careful and perceptive in ascertaining the cause of the injury. When the physician sees a child who has multiple injuries over many areas of the body, in which the fractures are not consistent with the conditions observed in a fracture that is truly the result of an unavoidable accident, the physician should recognize the possibility of deliberate assault or of failure to be protective (Fig. 2).

The customary fall from a chair, hobby horse or bicycle causes a single fracture. In the typical fall from heights, such as from porches or windows, outsiders witness the accident, and the fracture, as a rule, is unilateral and of the crushing type. *It is the multiplicity of the injuries from aggressive assault that casts doubt on the story of accidental occurrence told by the parent or guardian.* Fractures from assault are not necessarily multiple, although they often are; but they *are* always associated with other multiple injuries to the soft tissues: welts, bruises, burns of the face and neck or buttocks, abdominal tenderness because of visceral injuries, as from a kick, and frequently, subdural hematomas. The presence of either a hematoma or a fracture accompanied by other disorders should incite the search for the disturbance that is not at once apparent.

On immediate roentgenographic examination, only the obvious fracture may be observed. Somewhat later, a roentgenologic survey may disclose a hidden skull fracture, or small fractures near the epiphysis or metaphysis, or fractures of several ribs. The survey may also reveal healed old fractures. Other signs of neglect are also evident at once: malnourishment and the general physical appearance of untidiness.

This is where adroit elicitation of the history to confirm the suspected cause of injury becomes essential. History-taking must not be routine; it must not be perfunctory; it must not be the duty of the inexperienced; it must be painstaking and probing. The child in many cases cannot speak for himself; he is either too young or too frightened to tell what really happened. The immature adult who speaks for him, no matter how evasively, cannot long elude a knowing interrogation. The examiner, however, must guard against having an accusing attitude, so as not to lose control over the case before constructive measures can be accomplished, and particularly so that in the meantime the child will not become the target of vengeance.



Fig. 2. Parental assault may cause fractures, multiple hemorrhages, brain injury, skull fracture, burns, blindness. Their true cause may be difficult to ascertain except by shrewd history-taking and observant examination of all signs of violence.

What can the physician do when he is convinced of the cause of a child's injuries? Woolley and Evans[3] at first told the parents that they were aware of the unwholesome situation but offered to be helpful in resolving the family problem without "punitive" action; later, they tried enlisting the aid of social agencies, but this was not satisfactory because the families would move away out of reach, and in one instance, the child died of head injuries while the case was being investigated. Their subsequent policy became one of attempting by co-operative efforts to have the child removed from the household first, before the home environment was surveyed by authorities.

In large cities, injuries to children inflicted by cruelty or through indifference, or under alcoholic (Fig. 2) or psychotic behavior, seem to come to the attention of hospital personnel in cycles coinciding with the sporadic influxes of migratory workers and

vagrants. Such disturbing situations become the social interest not only of psychologists and psychiatrists and juvenile authorities and courts of law



Fig. 3 (Case 1). Parental assault fractures of the humerus and both bones of the left forearm. Child had previously suffered injuries to head with loss of sight.

but of general practitioners, pediatricians, and orthopedists who must treat the bodily hurts. At the Cook County Hospital, the records of children admitted with such injuries are referred to the Social Service Department or to a public assistance agency. The Family Court is informed by phone and by a detailed explanatory letter regarding the medical and social problem. In most instances, the Juvenile Protective Association assumes responsibility for evaluation and disposition of the child to a foster home.

Injuries to children from assault and neglect are not limited to indigent and ignorant families. When they are observed in private practice among the more economically favored, the problem, in a sense, calls for more delicate handling but nevertheless demands the physician's social intervention if the child is to be saved and society is to be spared. Dr. Karl Menninger believes that every criminal was an unloved and maltreated child. The criminal is the child who survives his maltreatment physically alone. The child of a family in a higher financial bracket than children seen in charity hospitals, who suffers at the hands of an unrestrained, aggressive, or psychotic adult, can be helped by enlisting the co-operation of a temperate member of the family to resolve the problem.

Reports of Cases of Assault

Case 1 (Fig. 3).—D. D., a colored boy, aged two years, was admitted to Cook County Hospital on May 10, 1958, because of a head injury and epileptiform convulsions and loss of sight which the mother said was caused by falling from a chair. The child improved and was discharged on July 12, 1958, but was readmitted on August 24 because of two fractured arms and what appeared to be cigaret burns over the buttocks. The mother reported that the child had fallen from his crib three days before admission.

Roentgenograms showed a fracture of the middle third with outward displacement of the distal fragments of the right humerus and a fracture at the distal third of both bones of the left forearm. The right arm was put in a hanging cast; the left arm was reduced and then immobilized with a plaster cast which was removed on September 15, 1958.

Following an investigation which proved the mother's neglect of the patient, arrangements were made for the patient and four other children to be placed in the home of the maternal grandmother.

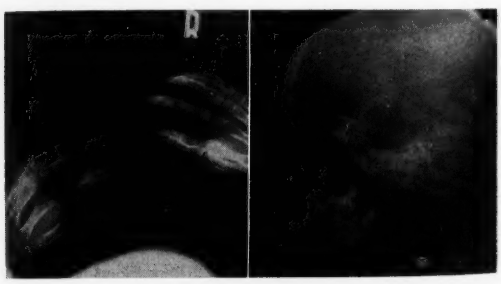


Fig. 4 (Case 2). *(left)* Linear fracture of right middle finger; proximal phalanx in good position. *(right)* Linear fracture of the right frontal bone without depression. Patient also had a hematoma of right orbit.)

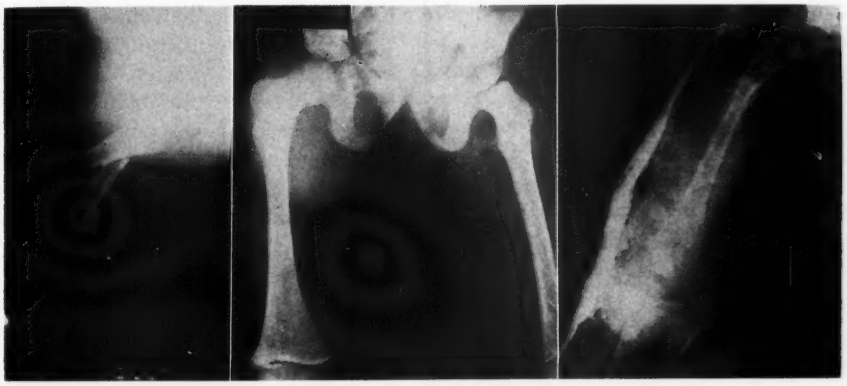
Case 2 (Fig. 4).—D. McG., a white girl, aged seven years, was admitted to Cook County Hospital on September 6, 1958, because of a possible skull fracture and apparently a fractured right arm which had occurred one hour before admission, when the patient's mother hit her with a baseball bat on the head and arms. Roentgenograms showed a linear fracture of the right frontal bone without depression, and a linear fracture of the right middle finger; the proximal phalanx was in good position.

The child's father told the social service worker that the mother had occasional outbursts of anger during which her hostility is always directed toward the patient. The mother is under psychiatric care. Both the psychiatrist and the attending physician recommended to Social Service that the child not be returned to her home but that at the time of discharge she be placed temporarily in the home of the father's niece. The case is being referred to the Juvenile Protective Association at this writing.

Case 3 (Figs. 5 and 6).—J. R., a colored girl, aged three years, was admitted to Cook County Hospital on August 8, 1958, because of a fractured leg incurred five hours before admission when the father intentionally stepped on the child and at the same time hit a sibling with a stick in "a fit of anger."

Roentgenograms showed a fracture of the left femur at the upper third with posterior displacement about 1 cm. and overriding and lateral angulation of the distal fragment. Bryant's traction was applied after manipulation. A hip spica cast was applied on August 27 and removed on September 28. There was some shortening of the left leg which measured 41.5 cm., the right leg measuring 43.5 cm.

The mother reported that the children annoy the father and that he frequently beats them for the slightest misdemeanor. The case has been referred to the Juvenile Protective Association, as protection of the five children is necessary.



Figs. 5 and 6 (Case 3). A girl, aged three years, was intentionally stepped on by her father, causing fracture of left femur at upper third with posterior displacement of about 1 cm., and overriding and lateral angulation of distal fragment.

Case 4 (Fig. 7).—S. T., a colored girl, aged six weeks, was admitted to Cook County Hospital on June 9, 1958, because of fractured ribs and a possible skull fracture, apparently caused by the mother while sharing the same bed with the infant whom she denied having assaulted; although the rib fractures associated with the skull fracture were typical of traumatic assault.

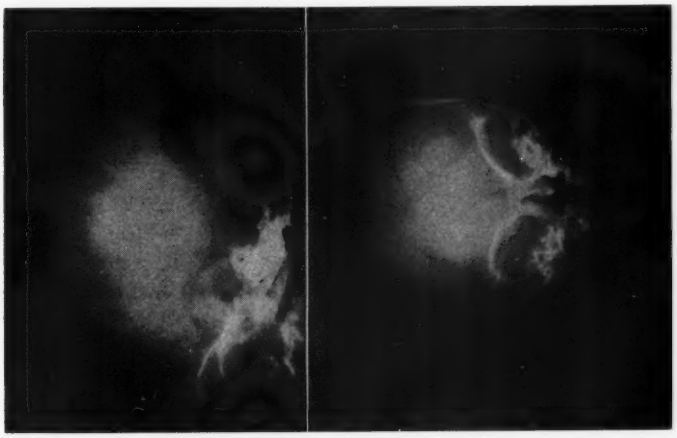


Fig. 7 (Case 4). Occipital fracture of skull incurred when child was kicked out of bed.

Roentgenograms showed fractures of the right posterior sixth, seventh, eighth, ninth, and tenth ribs, and six posterior left ribs which had partly healed in good position; there was also an occipital fracture of the skull.

The mother, who was nearsighted, withdrawn, and immature, at first said that she had possibly kicked the child in her sleep; later, she said that she had dropped the baby and then admitted that either she or her boy friend had kicked the baby out of bed. The case has been referred to Family Court.

(To be continued in October issue. References will appear with Part II)

Stereotactic Surgery in Parkinson's Disease

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STEREO-ENCEPHALOMETRY, or stereotactic surgery, is the term given to the surgical technique in which circumscribed, destructive lesions are placed in subcortical ganglia or pathways with negligible injury to adjacent structures. This is accomplished through the use of electrodes whose placement in the depths of the brain are precisely determined by mechanical guides. The use of mechanical devices for the production of discrete destructive lesions within the brains of experimental animals has been a common and familiar method in neurophysiologic laboratories for almost eighty years but only recently (since 1947) has it been adapted to humans. Many such devices have been constructed, most of which are variations of the Horsley-Clarke stereotactic apparatus first described in 1908.[1]

The stereotactic method, as applied to animal experimental work, depends for its accuracy and precision upon a fixed skull size and shape, and cannot be used in those animals exhibiting appreciable variation in skull architecture. The reason for this is that the method relies upon a constant correlation between external skull landmarks and internal brain structures or targets. Animals such as cats and monkeys do have a reasonably constant skull size and shape, and consequently are widely used for neurophysiologic investigation —on the contrary, the dog's skull architecture is notoriously variable, and therefore, its use is sharply limited by this factor. Unfortunately, at least in this respect, the human skull is also subject to a wide variability in size and shape, and indeed, even the internal structure of the brain itself exhibits a distressing variability. This has been the most important factor precluding the use of the stereotactic method in humans, and is the chief reason for the eighty-year delay in the adaptation of this technique for subcortical surgery in the human.

On the theory that stereotaxis could be practically applied to the human, if *internal* brain landmarks or reference points were used, Spiegel and Wycis,[2] developed such a method and reported its successful use in 1947. Originally, they used the pineal gland as a reference point, however, the unreliability of that structure has been amply demonstrated, and more dependable reference points are now used. The earliest application of stereotaxis to the human by Spiegel and Wycis[3] was in the field of psychosurgery. Lesions were placed in the dorsomedial nucleus of the thalamus, thereby achieving a lobotomy effect with minimal intellectual deterioration. Encouraged by successes in this venture, they then placed lesions in the mesencephalic spinothalamic tract for pain problems. Since their original report in 1947, it has become evident that the stereotactic method can also be used to advantage in such diversified problems as diseases of abnormal movements and subcortical epilepsy.[4,5] A number of stereotactic instruments have been devised and described by others and fairly large series of cases in each of the categories mentioned above have been reported, so that human stereotaxis, although still in its infancy, can now be considered beyond the theoretical stage.

The recent upsurge of interest in basal ganglia surgery for diseases of abnormal movements led to an interest in the sterotactic method by members of the Division of Neurological Surgery at the University of Minnesota Hospitals. To date, twenty-seven operations have been carried out on twenty-two patients with problems including seizures, and psychosis. Obviously, the comparatively small number of cases and relatively short period of follow-up — the longest being fifteen months—precludes the development of statistically

valid conclusions. However, it is felt that much can be gained by a consideration of our experiences to date, particularly in the group comprised of patients with Parkinson's disease.

Parkinson's disease, first described by James Parkinson in 1817, is actually a complex of symptoms or a syndrome. Clinically, the constellation of symptoms includes alternating tremor, cogwheel rigidity, mask-like facies, dysarthria, kyphosis, gait disturbance, poverty of movement, and disturbances of autonomic function. The two cardinal features, however, are tremor and rigidity, and most of the other symptoms mentioned can be explained on the basis of these two. The pathological changes associated with Parkinsonism are widespread and involve the central structures from the basal ganglia and thalamus rostrally through the reticular formation to the pons and medulla caudally. Even the cerebral cortex may be involved. There is no one specific site in which a lesion can be placed, or in which one has been found, that will account for the clinical picture. This clinical complexity should indicate that a single anatomical and physiological basis for all the stigmata of Parkinsonism will, in all likelihood, not be found. Even the etiology has remained a controversial point up to this time.[6] Inflammatory and toxic encephalitis, cerebral arteriosclerosis, post traumatic encephalopathy, and a number of other causes have been implicated. It seems clear, however, that of the estimated 400,000 sufferers of Parkinson's disease in this country, the majority are more or less clearly related to the 1917-18 influenza pandemic.

In spite of these complexities, an understanding of the patho-physiology is now beginning to emerge. Within the past few years, several laboratories have demonstrated that in the experimental animal an alternating tremor can be produced either by stimulation or by discrete destructive lesions within the bulbar reticular formation.[7,8] Moreover, stimulation or coagulation within certain of the basal ganglia, particularly the globus pallidus, effectively alters the tremor thus produced.

Attempts at surgical alleviation of abnormal movements began at the turn of this century when Sir Victor Horsley[9] reported the alteration of abnormal movements in an adolescent male by resection of a portion of the contralateral motor cortex. In the ensuing years, many additional reports of cortical ablations have been recorded.[10,11,12] It is the opinion of Bucy[13] and others that such cortical extirpations are inevitably followed by a spastic hemiparesis, and hence entails exchanging one serious neurologic disorder for another. Many other approaches to the problem have been tried, including section of a portion of the internal capsule,[14] partial section of the cerebral peduncle,[15] hemisection of the cord,[16] postero-lateral cordotomy,[17] sympathectomy,[18] and even prefrontal lobotomy. None of these procedures has been found entirely satisfactory. Each has had specific drawbacks, some sufficient to make the procedure unjustifiable. Then, Cooper[19] reported initially gratifying results from the ligation of the anterior choroidal artery and later from injection of destructive solutions into the basal ganglia in patients with Parkinson's disease. His enthusiasm was contagious. Subcortical surgery began to emerge as the most promising venture in the surgical alleviation of tremor and rigidity. Although an imposing number of cases of basal ganglia surgery have been reported by various authors in the past five years, it is felt that many important questions remain as yet unanswered. It is for this reason that the present project has been undertaken.

Inasmuch as Parkinsonism afflicts the young as well as the old, and exhibits a wide variety of clinical features in varying degree, there seems to be little value in attempting to define the classical case. Consequently, an investigative series must be an unselected one and must include the many natural variations which occur. In the series presented here, the chief indication for surgery is the presence of incapacitating tremor or rigidity —either unilateral or bilateral. Contraindications are limited to three: (1) general medical contraindications; (2) mental deterioration; (3) physiologic old age. It is hoped that as a result of this study it will be possible to define more accurately the indications and contraindications for this type of surgery. Preoperative and postoperative evaluations have been conducted in association with Dr. A. Iannone, Division of Neurology. These include detailed neurological examinations, electroencephalographic studies, and motion picture analysis. In addition, detailed objective measurements of tremor, rigidity, and motor functions are carried out at predetermined intervals by Dr. D. Webster at the Minneapolis Veterans Administration Hospital. The techniques involved in these various studies are rather complex, and will be

the subject of future reports; consequently, comment will be limited at this time. However, it should be noted that although a certain amount of reliance is placed upon the estimates of the patient and his family concerning degree of disability, degree of improvement, and so forth, the detailed objective data supplied by these studies is of invaluable assistance in the overall study of each case.

In this clinic, the Spiegel-Wycis method of stereotaxis has been adapted; and since it has been reported in detail elsewhere,[20] only the salient features will be discussed at this time. The procedure is carried out in two stages, the first under general anesthesia, and the second under local anesthesia. The first stage is devoted to obtaining accurate x-ray studies necessary for the localization of the intracerebral target. The second stage is devoted to study of the target area by means of stimulation and observation of the clinical response, patterns of evoked potentials, and under the usual circumstances, destruction of the target by means of electrocoagulation.

Through pneumoencephalography, two intracerebral reference points are routinely identified—these are the anterior and posterior commissures of the third ventricle. They are convenient reference points for the following two reasons: first, they are readily demonstrable in a conventional pneumoencephalogram and second, they are in close proximity to the usual target points within the basal ganglia. This latter point is especially important because the value of any structure as a reference point varies inversely with its distance from the target. Error is considerably minimized through the use of two reference points rather than one. Dr. H. O. Peterson has been of invaluable assistance in directing and contributing to this aspect of our investigation. With the information thus derived, it is possible to plot geographically the area representing any desired subcortical structure. A brain atlas, carefully conceived and devised, must be used in doing this. It is respectfully admitted that considering the variability in brain structures which has been demonstrated to exist by numerous investigators,[21] one cannot predict the configuration of a given structure which will hold for all patients. That is to say, should one make a lesion of sufficient size to destroy 100 per cent of the globus pallidus, it is inevitable that in a certain percentage of patients a portion of that lesion will actually fall outside the globus pallidus and injure adjoining structures. However, it is possible to plot an area which will represent a portion of the desired structure in *every* instance without danger of encroachment on the adjoining structures. The approach used in this clinic is to concern ourselves primarily with this constant target area; and should this prove insufficient for good clinical results, the marginal zone will be probed with stimulation at a later date.

TABLE I. SUMMARY OF DATA ON FOURTEEN CASES OF PARKINSON'S DISEASE

Patient	Age	Laterality	Duration of Symptoms	Clinical Result
R.C.	41	Unilateral	6 yrs.	Excellent
L.L.	47	Unilateral	20 yrs.	Excellent
H.F.	55	Bilateral	5 yrs.	Good
P.F.	57	Bilateral	38 yrs.	Fair
R.L.	49	Bilateral	20 yrs.	Good
R.H.	58	Bilateral	6 yrs.	Good
E.W.	51	Bilateral	10 yrs.	Good
V.M.	47	Bilateral	20 yrs.	Good
N.F.	61	Bilateral	25 yrs.	Fair
H.L.	70	Unilateral	5 yrs.	Excellent
L.J.	49	Bilateral	20 yrs.	Poor
W.S.	41	Bilateral	8 yrs.	Excellent
F.D.	66	Bilateral	3 yrs.	Poor
R.O.	55	Bilateral	31 yrs.	Fair

The actual technique is, in itself, not tedious. An electrode carrier is used which is fastened to the patient's skull by means of implanted stainless steel screws. The carrier is graduated in all planes in millimeters and in degrees to obtain maximum versatility. The screws are countersunk in the skull and remain in place permanently. This permits, at any time, re-application of the instrument in exactly the same position, utilizing the original co-ordinates and without the necessity of repeated air injections. A fine electrode, 1.2 mm. in outside diameter, is used. With it, one may obtain electograms or it may be used for stimulation or coagulation. It is even adaptable to the injection of fluid substances. For purposes of coagulation, we have routinely used direct, anodal current. In the laboratory, we have found that 10 milliamperes of current applied for one minute will produce an area of coagulation which is ovoid in shape and measures approximately 4 x 2 mm. in size. A planned pattern of such lesions is used to produce larger areas of destruction with some degree of axial orientation.

Table I summarizes the data up to this time on the fourteen cases of Parkinson's disease which have been studied and in which the patients have been subjected to pallidotomy. Several points are worth noting: the age range is from forty-one years to seventy years, with the majority being in

the sixth decade of life. Only three patients had essentially unilateral disease while in eleven it was distinctly bilateral in distribution. Duration of the disease varied widely, from a minimum of three years to a maximum of thirty-eight years. The last column represents a consensus clinical estimate of the therapeutic result in regard to tremor and rigidity. Four patients are classed as excellent, representing 95 per cent or better reduction of both tremor and rigidity. Five patients are classed as good, representing 66 per cent to 95 per cent reduction of symptoms. Three patients are classed as fair, representing 33 per cent to 66 per cent reduction of symptoms. Two are classed as poor, one because of a permanent hemiparesis, the second because of death which occurred two and one-half weeks postoperatively following a pulmonary embolus. It should be noted that age and duration of disease, while undoubtedly influencing the results of surgery, do not necessarily preclude satisfactory results. The oldest patient in the series, age seventy, is classed as an excellent result. Three patients with symptoms of twenty years or more duration are classed either as good or excellent.

TABLE II. COMPLICATIONS

Patient	Age	Duration of Disease	Complication
H.F.	55	5	Mental change, temporary
P.F.	57	38	Pseudobulbar palsy
L.J.	49	20	Permanent hemiparesis
F.D.	66	3	Death from pulmonary embolus 16 days postoperative
R.O.	55	31	Homonymous hemianopsia

Table II summarizes the complications which have followed pallidotomy. Following is further explanation of the first three complications in Table II. The remaining complications are self-explanatory.

Case Reports

Case 1.—H.F., aged fifty-five, the only bilateral pallidotomy in the series, underwent his first operation uneventfully. However, following a pallidotomy on the second side, which was carried out one month later, he experienced a curious alteration in mental abilities. While retaining an I.Q. of 117, he exhibited judgment and emotional content at about the five-year-old level. This persisted for a period of three months, when he reverted rapidly to normal status.

Case 2.—P.F., aged fifty-seven, had advanced disease of thirty-eight years' duration. In addition, he exhibited a hemiparesis as a sequel of encephalitis which he had had prior to onset of the Parkinson's disease. Following unilateral pallidotomy, he exhibited a persisting pseudobulbar palsy.

Case 3.—L.J., aged forty-nine, suffered an apparently permanent hemiparesis of moderately severe degree.

Table III concerns that single factor in which the patient and his family are most interested—rehabilitation. Considered realistically, this means different things to the patient who is confined to a wheelchair, incapable of self-care, than to the patient who is working every day in spite of a handicap. The ability to feed himself is a major gain for one, while another takes this for granted.

TABLE III. REHABILITATION

	Excellent	Good	Fair	Poor	Total
Significant gains	3	4			7
Minimal gains but more comfortable	1	1	2		4
Worse			1	1	2

Considered in this light, we have simply tabulated the patients in terms of "real gain" over and above their capabilities prior to surgery. As is readily apparent from the figures, significant gains in rehabilitation were made by only half the patients. Particularly impressive is the fact that *good or excellent reduction of tremor and rigidity is not synonymous with rehabilitation.* The factor of motivation is of paramount importance in this regard, and remains exceedingly difficult to evaluate, both preoperatively and postoperatively. Related to this is one important question which we hope to answer eventually; namely, should this type of therapy be restricted to those most likely to utilize it for significant gain in rehabilitation, or is the comfort of the patient in itself a legitimate indication? The tendency in most clinics at the present time is to confine efforts to the former group.

Discussion

There are four distinct advantages to stereotaxic surgery utilizing the technique described above:

1. It is an exceedingly accurate method. Destructive lesions of known size can be placed in a predetermined locus with a minimum of damage to surrounding structures. It has been argued by some that such accuracy is unnecessary in

most subcortical surgery presently being done. However, we feel that it is a definite advantage, both in terms of safety to the patient and to interpretation of the altered physiology. This is especially true of thalamic lesions where one is dealing with a group of nuclei with very diverse connections.

2. Before any destructive lesion is made, it is possible to carry out electrostimulation. This has the advantage of a physiologic demonstration of the position of the electrode.

3. There is precise control over the size of the destructive lesion made. As stated previously, one coagulation produces an ovoid area of destruction of approximately 4 x 2 mm. size. Six to twenty-two lesions have been produced in various patients, using as the end-point the desired clinical effect rather than an arbitrarily chosen number.

4. Reapplication of this stereo-encephalotome in a precisely identical position is a simple matter. Therefore, one is able to produce further lesions at intervals should this prove necessary. Re-application of the instrument has been necessary in a few patients at intervals up to six months, and it has been possible to do so without the need for repeat pneumoencephalography or any guesswork.

The question has arisen as to whether or not there is a somatotopic localization within the globus pallidus with respect to tremor and rigidity. Inasmuch as the stereotactic method lends itself to investigating such possibilities, an attempt was made to verify this hypothesis by varying the axis and direction of the lesions as they are progressively enlarged. At the present time, it is felt that somatotopic localization has not been delineated, and reduction of tremor or rigidity depends more upon the size of the lesion than its location within the nuclear mass under consideration.

Tremor and rigidity have been repeatedly named as the two symptoms in which we are primarily interested, and perhaps the impression has been given that they respond similarly to surgical destruction of the globus pallidus. This is not the case. Rigidity has been effectively reduced in every instance with relatively small lesions, and there has been little tendency for recurrence. On the other hand, tremor has not been significantly reduced in every instance, has required large lesions for effective alteration, and exhibits a distressing tendency to recur in the weeks and months following surgery.

TABLE IV. STIMULATION RESULTS

Disease	Structure	Response
Parkinsonism	Medial globus pallidus	Tremor exaggerated
	Lateral globus pallidus	None
	Internal capsule	Flexion of contralateral extremities
Athetosis	Medial globus pallidus	Movements mildly exaggerated
	Anterior V. L. nucleus	Movements markedly exaggerated
	Posterior V. L. nucleus	Dysesthesias in contralateral extremities
Centrencephalic seizures	N. centrum medianum	Arrest reaction
	N. ventralis anterior	None
Psychosis	Dorsomedial nucleus	Evoked potentials in frontal scalp leads
Hemiballismus	Medial globus pallidus	Movements mildly exaggerated

At the time of surgery, stimulation of the various subcortical masses has been carried out. In general, the results have been somewhat inconstant, and further work must be done before stimulation can be used as a reliable guide for the position of the electrode. The chart presented in Table 4 is then, merely a preliminary step in that direction.

The interpretation of the phenomena resulting from stimulation varies, of course, with the pathophysiologic aberrations present in each individual case. It is readily apparent from the data in Table IV that electrostimulation can be important in the study of a variety of disease states other than Parkinsonism.

Summary

A method for carrying out subcortical surgery has been described. Its application to the problem of Parkinson's disease has also been described. Experience with fourteen patients with Parkinson's disease has been discussed and a preliminary report on both the clinical and investigative aspects has been presented. It is felt that much more data must be accumulated in order to evaluate properly the place of surgery in diseases of abnormal movements.

(References on Page 1296)

Staphylococcic Sepsis in Hospitals

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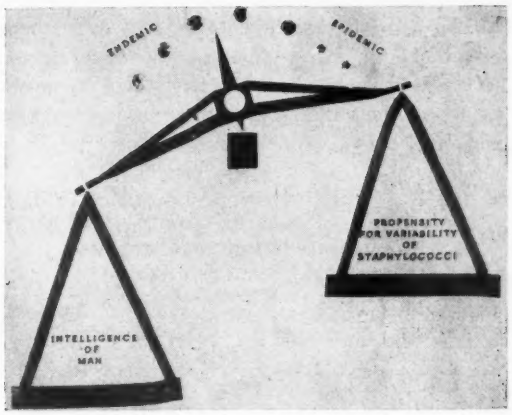


Fig. 1. The eternal struggle for life.

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SEPSIS caused by staphylococci in hospitals has lately become the number one communicable disease of the country. Until medical research has found a permanent control for infections due to Micrococcus pyogenes, physicians are faced with what may be a long term continuous struggle with this most versatile and ubiquitous of all of man's parasites. This presentation will touch on some of the more important aspects of the epidemiology and control of staphylococci.

The osteomyelitis found in Egyptian mummies from 3000 B.C. is documentary evidence of the long duration of parasitism of man by these micrococci. The "laudable pus" of Paraselsus more than 500 years ago may mark the beginning of a feeling of familiarity for a seemingly innocuous infection; an attitude which persists today in the minds of some physicians. Lord Lister's monumental efforts in 1867 initiated an era of antisepsis, the technique of which has undergone considerable improvement. With the recognition of the serious nature of the problem with staphylococci, we have learned that our knowledge of antisepsis in hospitals is superficial and inadequate. About a decade ago with the discovery of penicillin there was a short lived period during which man had apparently gained control of this destructive, sinister, adversary only to find that, differing from most other bacteria, staphylococci have an ominous, genetic heritage; an ability to adapt themselves to many nocuous environmental exposures including those to transiently germicidal antibiotics. As a result of such exposure, the newly born strain of Micrococcus pyogenes frequently maintains all of the resistance to other antibiotics previously developed by its progenitors and at the same time may have gained or lost virulence for man. In essence, it is this innate adaptability of staphylococci (an evolutionary product of the eternal struggle of living things to survive) against which man's intelligence is now pitted (Fig. 1).

Natural Characteristics

Staphylococci can usually be recognized by their morphology because of their large size, coccus form, Gram-positive staining and the frequent occurrence in three dimensional clusters. Because of their universal distribution, they are relatively frequent contaminants of the bacteriologist's media. They have unusual resistance to heat and drying. The Micrococcus pyogenes variety aureus forms a yellow pigment, an important sign of pathogenicity.

Although not demonstrated by the usual methods of staining, it is sometimes said to have capsule formation. Practically all staphylococci are grown as facultative anaërobic organisms on a wide variety of simple artificial media.

TABLE I. SURVEY OF STAPHYLOCOCCUS AUREUS, COAGULASE POSITIVE PHAGE 80/81, INFECTIONS DURING SIX MONTHS
Number of Patients Surveyed—51

Skin infections	29
Pneumonia	6
Internal abcesses, lesions	6
Urinary infections	2
Eye, nose and throat infections	5
Dermatitis	1
Burns	1
Bacteremia	1

The ability of an isolated strain to coagulate plasma (coagulase test) is currently the one easily performed procedure most widely accepted as indicative of pathogenicity for man. It is conceivable that a few pathogenic strains may not have a positive coagulase test. Certainly, the loss of ability to form yellow pigment (staphylococcus albus) does not always indicate a lack of pathogenicity. Other signs of a pathogenetic nature of a strain are indicated by the presence of: hemolysins (destroys RBC's), exotoxin (necrosis of tissue), enterotoxin (food poisoning), leukocidin (kills WBC's), hyaluronidase (spreads infection), penicillinase (destroys penicillin), fibrinolysin (dissolves fibrin), protease (digests protein), lipase (fat splitting), desoxyribonuclease (nucleic protein), and others.

Few strains of the pathogen seem to be completely alike, consequently a means of identification of the various strains has become an important and difficult subject of research in bacteriology. At the present time, phage typing is generally considered the most practical way of classifying specific strains of staphylococci. This time consuming procedure helps determine whether a single strain is causing an epidemic or a high level of endemicity in a hospital or whether a heterogenous mixture of strains is found in a series of cultures of infections. Pure and mixed strain epidemiologic problems require entirely different interpretation as to the source of the bacteria. Certain phage types and particularly the 80-81 variety are now known for their widespread distribution and unusually high virulence. Like other characteristics of the staphylococci, the phage type may change in a given strain. This alteration does not appear to occur in the serologic methods of identifying staphylococcic strains; however, the latter are not yet considered practical for general usage.

Epidemiology

The futility currently being experienced in antibiotic therapeutic research relating to staphylococcus sepsis has accentuated the urgency of a need for knowledge pertaining to the ecologic aspects of this parasite, particularly those relating to epidemiology. A valid, rational and unifying concept of this science of the study of the etiology, frequency, distribution and other factors of infectious diseases was most comprehensively formulated by Theobald Smith (1934) in the Vannxem lectures delivered at Princeton. The gist of his contention was that all infections of man are the manifestations of a parasitism and that they express the eternal struggle for life by both the host and the parasite. This concept is eminently suited to the relationships of Homo sapiens and Micrococcus pyogenes variety aureus. One cannot escape the thought that the older of these two species with its innate versatilities at mutation and selective adaptation could become the most dreaded microparasite established in the orbit of man.

The importance of the role of *crowding of susceptibles* in inciting communicable diseases was apparently first emphasized by Sir James Simpson. More than a century later the staphylococci are found to be a menace primarily in our hospitals where large numbers of susceptibles are crowded, infections are abundant, 20 to 60 per cent of the personnel are chronic ambulatory carriers, and the chances of *cross contaminations* between the three groups are numerous. Our recent studies (Table I) seem to indicate a decided spread of the antibiotic resistant, phage type 80-81 staphylococci to the population outside of the hospital where approximately 50 per cent of these infections had their origin. Where this will end is difficult to predict.

The coagulase positive (virulent) strains of staphylococci are *propagated* in the sites of infections, on mucous membranes of the nose and throat of carriers, in intestinal tracts particularly of infants, about the umbilical cord in the newborn, and occasionally on areas of the skin such as in the groin of some individuals. Domestic animals harbor the organism. Nearly all other sources of staphylococci represent indirect reservoirs or vectors for the bacteria which outside of the sites of proliferation soon become an almost spore-like, dormant form of the organism. The great majority

TABLE II. ALL INFECTIONS—SIX-MONTH PERIOD
(Except Surgicals)

Number of Each	Disease or Site of Culture	Penicillin Resistant	Penicillin Sensitive	Not Specified	Staph. Coag. Negative	Coli Aero-bacter	Entero-cocci	Pseudo-monas Sp.	Proteus Sp.	Para-colon Sp.	Beta Hem. Strep.
94	Skin infections	38	20	9	7	13	14	1	4	—	7
22	Internal abscesses	5	1	2	1	14	8	—	2	—	1
13	Appendicitis, Peritonitis	—	—	—	—	8	2	1	—	1	3
9	Urinary infections	5	3	—	—	1	1	1	—	—	—
13	Eye, ear, nose and throat infections	8	2	1	—	2	—	1	1	1	2
5	Burns	3	—	—	—	1	—	2	—	—	—
2	Diarrhea	1	—	—	—	2	1	2	1	—	—
9	Pneumonia	7	2	—	—	—	1	—	—	—	—
1	Bacteremia	—	1	—	—	—	—	—	—	—	—
1	Osteomyelitis	—	1	—	—	—	—	—	—	—	—
7	Dermatitis	3	1	2	—	2	—	—	—	—	—
1	Rash of newborn	1	—	—	—	—	—	—	—	—	—

of infections of the skin are considered minor as they pertain to mortality but their morbidity and disseminating potentials have been repeatedly shown to be of great importance in this problem. The heavy and rapid contamination of the sick babies to the more recently admitted infants in a self-propagating continuous chain. Perfect housekeeping methods, complete absence of adult carriers and otherwise ideal circumstances may exist at the time of a fulminant epidemic. The healthy

TABLE III. COMPARATIVE SENSITIVITY STUDIES PERFORMED ON STAPHYLOCOCCUS, COAGULASE POSITIVE, ISOLATED FROM NOSE AND THROAT CULTURES

Year	No. of Tests	Antibiotics—Percentage																							
		Penicillin				Erythromycin				Tetracycline				Chloramphenicol				Carbomycin				Neomycin			
		HS	MS	SS	R	HS	MS	SS	R	HS	MS	SS	R	HS	MS	SS	R	HS	MS	SS	R	HS	MS	SS	R
1958	69	34.8	1.4	11.6	52.2	63.8	21.7	2.7	11.8	33.4	40.5	4.3	21.8	37.8	40.5	8.7	13.0	59.8	24.6	8.7	7.2	20.2	58.0	17.4	4.4

room environment by patients with open infections such as those of the skin, pneumonia, empyema, sinusitis, bronchitis, entero-colitis, and certain patients with tracheotomy and urinary incontinence has been demonstrated to take place in a matter of a few hours. This added to the resistance of staphylococci to drying, heat, and chemicals permits the organism to float about on dust particles and fomites, to the myriads of resting places in the recesses of the hospital awaiting a more favorable environment in the fluids of man to again propagate a species possibly even better endowed to care for itself at man's expense.

The staphylococcus infection is *endemic* in all modern general hospitals. Sporadic major *epidemics* of a progressive type have occurred in and even closed large institutions at scattered points in the United States. The fact that 20 to 60 per cent of the personnel of hospitals are *ambulatory carriers* in close and frequent contact with patients is basic. Nursery epidemics generally follow a pattern. A virulent type staphylococcus is introduced into a nursery. It readily colonizes nasal passages of newborn infants and is passed from the older carrier problem in this situation is the basic reason for the epidemic and when it is controlled the epidemic will stop.

The *virulence* of staphylococci is such that the usual experience is that a high nasal carrier rate exists and many minor skin infections are to be expected, punctuated by occasional very serious or fatal infections, all due to the same strain of staphylococci. Clinical experience suggests that infections contacted directly from other infections are, generally speaking, more likely and more serious than those in which the bacteria are from carriers, and the latter infections appear to be more likely and more serious than those caused by the more dormant organisms on dried dust particles from the inanimate reservoirs of the hospital. The great bulk of the infections in our hospital experience are the minor skin infections (Table II) where the organism is increasing in great numbers and being on a surface can be easily disseminated. In one of our surveys, the nasal carriers had a high per cent of antibiotic resistant, virulent organisms (Table III). The low virulence of staphylococci might be compared with the high mortality result-

ing in other contagious diseases, such as cholera, where the organism frequently quickly kills its victim and thus the propagator and disseminator are buried along with his cargo of deadly vibrio to stop

itating diseases. It may be that the resistance of many of these patients would eventually fall to a point where many bacteria ordinarily considered harmless might invade and kill. This group of in-

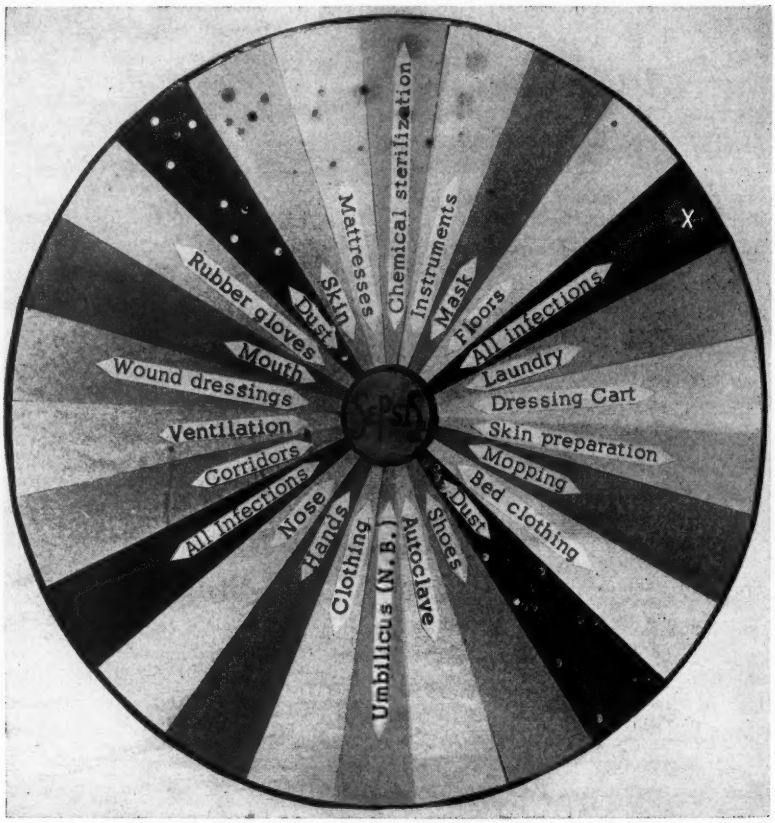


Fig. 2. The Roulette universe of staphylococci. X indicates the staphylococcus.

the sequence promoting a spread of the parasite. In the entire world, cholera is now endemic only in certain overly populated, unsanitary areas of India.

The *individual susceptibility* of man varies greatly. Infants are highly susceptible but are said to develop a resistance equivilant to that of an adult during the first year of life. This resistance sometimes appears to be lost in the waning years of old age.

The groups of patients most frequently involved currently in staphylococcus infections are: (1) those with surgical wounds and otherwise broken dermal barriers; (2) newborn babies, (3) nursing mothers, (4) premature infants and (5) a large heterogenous group of patients with lowered resistance, especially the elderly with chronic debil-

dividuals with increased susceptibility includes patients with diabetes mellitus, malignancy and many other similar chronic wasting diseases, also those with chronic alcoholism, bed sores and other breaks in the skin such as dermatitis, burns, frostbites, indwelling catheters and skin "cutdowns." Included also are influenza, coma, vomiting, agranulocytosis, starvation, prematurity, toxemias, allergies, iatrogenesis including heavy sedation, adrenal steroids and other hormones and nitrogen mustards, folic acid antagonists and other neutropenia producing drugs. Infections by staphylococci do not produce a measurable *conferred immunity* as in typhoid fever, thus a continuous site for propagation is favored in the majority of mankind. The rare occurrence of a fulminant fatal septicemia

from a furuncle in an apparently robust, healthy individual is a well known phenomena.

The *community susceptibility* will vary with the distribution of the patient population of a given hospital. Today much larger numbers of elderly patients are admitted to general hospitals with their chronic ailments and lowered resistance. This shift in hospital population is one of the important factors of the increased *incidence* of staphylococcus infections in the nosocomial environment.

The inter-relationship of *dissemination* and *propagation* in a hospital is diagramatically and incompletely illustrated in "The Roulette Universe of Staphylococci" (Fig. 2). The greater the staphylococcus endemic level in a hospital the greater the *chance* of sepsis. An average patient entering an average general hospital has approximately a 20 to 50 per cent chance of having his nasal mucous membranes colonized by antibiotic resistant, virulent staphylococci in from forty-eight to seventy-two hours. If the patient has a large break in his skin barrier or has lowered resistance to infection because of a chronic debilitating disease or some iatrogenic alteration, his chances of contracting a serious staphylococcus infection are greatly enhanced.

Control

Until some anti-infectious agent is discovered which will permanently control man's staphylococcic parasites, these micro-organisms must be held in abeyance by a carefully planned and directed multiphased program. Since large segments of the hospital lay personnel are involved and much inspired direction and detailed supervision is necessary, physicians have combined with the hospital administration and departmental supervisors to form the Hospital Infection Committee. There follows a suggested mostly self-explanatory outline of the composition and responsibilities of this committee.

Hospital Infection Committee

I. Composition
- A. Medical staff
- B. Administrative department
- C. Nursing department
- D. Housekeeping department
- E. Laboratory

II. Responsibilities
- A. Surveillance
  - (1) routine culture of all infections
  - (2) measure endemic status
    - (a) surgical procedures
    - (b) housekeeping procedures
    - (c) carrier status of personnel and staff
    - (d) ventilation hygiene
    - (e) special problem areas
  - (3) maintain "outcome" records
    - (a) surgical wounds
    - (b) all other infections
    - (c) autopsy infections
    - (d) newborn follow-up (8 weeks)
    - (e) inanimate environment
  - (4) formal peroidic reports
    - (a) medical staff
    - (b) personnel
- B. Control
  - (1) evaluation of all phases
  - (2) recommend changes (to staff and administration)
  - (3) initiate changes
  - (4) institute epidemic controls
  - (5) assign personal responsibilities
  - (6) surgical dressing cart or tray usage
  - (7) isolation rules
  - (8) segregation of departments
  - (9) segregation of patients
  - (10) infections of personnel
  - (11) admission policy
    - (a) infected patients
    - (b) unusually susceptible patients
  - (12) inter-hospital relations
  - (13) charges for "demand" cultures
  - (14) charges for "enforced" layoff
- C. Education
  - (1) hospital personnel
  - (2) all professional groups
  - (3) import "expert" speakers
- D. Measure effectiveness
  - (1) comparative records
    - (a) endemic status—A (3)
    - (b) all infections—A (3)
- E. Research

The committee is organized under the control of the medical staff with complete co-operation of the hospital administration, nursing staff, housekeeper and pathologist. Nothing will cast off the veil of uncertainty concerning the existence of the presence of a staphylococcus problem in a hospital as quickly as unnecessary deaths from the disease. A medical staff report of necropsy studies followed in quick order by imported authoritative medical speakers, then by reports of a bacteriologic assessment of the magnitude of the local problem, including cultures from inanimate objects, "fallout" cultures, nasal carrier frequency, and staphylococcic infections of all types. A critical study of the numerous technical nosocomial procedures involved by an "out of town" authority will hasten a badly needed knowledge of the lay personnel. Once the medical staff has visualized the long term omnipresent danger to which their patients are exposed, there should exist a unified effort necessary for success in our independent methods of private practice.

The six widely used approaches to the partial control of the hospital sepsis problem include: (1) the establishment of mutually beneficial rules of hospital medical practice; (2) modernization of housekeeping procedures; (3) improvement of numerous technical paramedical practices; (4)

maintenance of epidemiologic records; (5) publication of periodic reports, and; (6) educational experiences for both lay and professional groups. These should maintain the continuous self appraisal and interest necessary for success in this long term project.

TABLE IV. "FALLOUT" DURING OPERATIONS
(Blood Agar Plate)

Surgical Procedure	Number of Cases	Total Colony Count/Plate Max.—Min.	Total Staph. Aureus Colonies/Plate Max.—Min.	Total Other Bacteria Colonies/Plate Max.—Min.
Appendectomy	9	62-6	11-0 (5 neg.)	53-5
Cholecystectomy	10	48-5	10-0 (6 neg.)	40-5
Herniorrhaphy	10	41-1	8-0 (3 neg.)	40-1

Possibly the greatest problems of the Hospital Infection Committee in a private institution are concerned with the standardization and enforcement of rules on the practice of medicine. A limitation of the use of specific antibiotics to preserve their usefulness for the more seriously infected patients in a given hospital environment may easily result in a variation of opinions, in spite of the acknowledged value of the ruling. An added hospitalization expense is incurred by every strict isolation ruling, yet, this practice for the "open" types of staphylococcus infections must be mandatory. Possibly some physicians might be inclined to overlook minor stitch infections in their patients whereas a good nurse, so ordered, will see to it that cultures are taken and the infection recorded. When dressing wounds, "non-touch" techniques alone are not as good as when combined with the more time consuming use of sterile rubber gloves, masks, and the aseptic disposal and sterilization methods for contaminated objects. Restrictions of physicians with staphylococcus infections is a problem. In the operating rooms and nursery, it may be necessary to "lay off" the nonprofessional and nursing personnel with pay to protect the patients from open infection in these ambulatory personnel.

A critical review of surgical operating room techniques has resulted in a new set of rules of procedures. The only pathway from the contaminated hospital environment to the operating room leads through a locker room where there is a complete change into sterile clothes with an intervening shower. Sterile covers for the usually badly contaminated operating room shoes is a must. Any professional visitors go through the same routine. Movement through doors and about the operating room is restricted. Minimum ten-minute hand scrubs and hourly exchanges of the best available masks are mandatory. A more detailed pre-entrance preparation of patients with a complete shedding of all contaminated covers and clothes and a skin preparation designed to penetrate hair follicles is rigidly followed. Alkaline soaps are neutralized by acid detergents and alcohol neutralizes the beneficial action of creosol products, therefore a proper selection of cleansing and antiseptic agents is necessary. A routine "error check" conducted by the head nurse at the end of each operation keeps everyone on the alert for punctured gloves and other slips in technique. "Fallout" cultures (Table IV) should be on a routine periodic basis. The postoperative sterilization of the room and instruments follows a well-established ritual. Culture controls of autoclaves must be routine. Even a late admission of the patient to the hospital to prevent nasal colonization prior to the operation is advocated by some surgeons.

Cleanliness alone is no longer adequate in the numerous housekeeping activities about the hospital. Controlled, germicidal antisepsis is a necessity. The usual wet floor mopping of yesterday can be one of the greatest disseminators of staphylococci by way of the largest of all reservoirs of these organisms, the floor. The extra cost of a germicide such as Amphyl, Wescodyne, O'Syl, Tergisyl, and Permachem and others when added to the cost of floor mopping, wiping of the walls and furniture of the contaminated sick room are small in comparison to the cost of the staphylococcus complications in the sick. The necessity and means of sterilization of contaminated blankets, mattresses and other bed clothing has been repeatedly stressed along with the use of labeled, individual impervious bags for transporting articles through hospital corridors and laundry chutes. The exchange of empty for filled waste baskets and garbage cans prevents local contamination.

TABLE V. SURGICAL WOUND INFECTIONS
Year—1958

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number of Operations	578	500	558	551	557	549	546	466	497	548	499	536	6,354
Staphylococcus Coag. pos.*	8	8	8	2	2	2	5	4	6	6	6	12	69
Others†	4	—	—	8	11	4	3	6	7	5	3	5	56

*and mixed cultures
†not mixed with Staphylococcus

TABLE VI. SURGICAL WOUND INFECTIONS ETIOLOGIC FREQUENCY FOR TWELVE MONTHS

		Staph. Aureus. Coag. Pos.	Staphylo-coccus Coag. Neg.	E. Coli.	Entero-cocci	Pseudo-monas Sp.	Proteus Sp.	Para-colon Sp.	Beta-hem. Strep.	Cl. Welchii
"Clean" operations	106	53	17	26	20	7	4	6	4	2
"Dirty" operations	36	16	2	9	5	4	1	1	1	2

TABLE VII. COMPARATIVE SENSITIVITY STUDIES
STAPHYLOCOCCUS, COAGULASE POSITIVE, ISOLATED FROM DRAINING LESIONS

Year	No. of Tests	Antibiotics—Percentage																					
		Penicillin				Erythromycin				Tetracycline				Chloramphenicol				Carbomycin				Neomycin			
		HS	MS	SS	R	HS	MS	SS	R	HS	MS	SS	R	HS	MS	SS	R	HS	MS	SS	R	HS	MS	SS	R
1958	196	12.2	5.7	4.6	77.5	68.0	14.3	2.6	15.1	18.4	19.4	3.6	58.6	34.8	36.2	13.3	15.7	65.5	23.0	6.2	5.3	26.3	53.4	16.7	3.6
1956	82	12.4	7.3	10.8	69.5	58.5	13.5	2.4	25.6	15.8	19.0	5.2	60.5	39.5	43.5	7.3	10.0	—	—	—	—	—	—	—	—
1954	31	12.5	6.5	39.0	42.0	35.7	14.3	25.0	25.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

The most important inanimate vector of staphylococci is dust. Those who care for the sick must understand that any activities which stir up or make dust, spread staphylococci. The unnecessary shaking of contaminated bed clothing is as filthy as spitting on the floor. Epidermis and clothing particles fall from the body and clothing and currents of air pick up fallen particles as the result of walking across an operating room floor. Air-conditioning apparatus once designed primarily for heat and humidity control must be altered to include better filters for eliminating bacteria. The air-conditioning pressures must cause a steady flow of air from the inside out, in nurseries and operating rooms.

The danger of the "fallout" from the ambulatory necessitates isolation of the more susceptible patients and segregation of whole sections of the hospital including the nursery and operating rooms and a separate isolation department for the patients with staphylococcus infections. The architecture and building materials of new hospitals must be altered to meet this new challenge of human security.

More adequate segregation of the newborn from each other and from the rest of the hospital has become a necessity. If individual cubicles with positive pressure air-conditioning is not possible, a division of the babies according to dates of birth so that older infants do not contaminate the more recently born may help. Complete isolation of the baby in the mother's room has been a solution. Others have advocated routine use of nasal jells with antibiotics. The vulnerable umbilical cord must be protected with a satisfactory germicide. The stools must be considered heavily contaminated. Follow-up records of discharged newborns for at least eight weeks are essential for the proper protection of a nursery. Mothers should not nurse infants whose nasal mucous membranes are colonized by the 80-81 phage type staphylococci.

The Hospital Infection Committee must know the epidemiologic status in all sections at all times.

TABLE VIII. AUTOPSY CULTURES DURING 1958 (ST. LUKE'S HOSPITAL)
(Number of Autopsies, 364; Per Cent with Infections, 40)

No. of Each	Disease	Pure Cult. Staph. Coag. Pos.	Staph. Coag. Pos. (and mix)	Coli Aerobacter	Enterococci	Proteus Sp.	Paracolon Sp.	Pseudomonas Sp.	D. Pneumoniae	Staph. Coag. Neg.	Beta Hem. Strep.	Alpha-hem. Strep.	H. Influenzae	Cl. Welchii	Mima Herellea	Salmonella Sp.
47	Bacteremia	7	6	24	17	9	3	1	—	2	—	7	1	—	2	—
55	Pneumonia	1	20	23	8	9	3	4	3	6	1	4	—	—	1	—
19	Peritonitis	2	2	13	11	9	1	3	—	1	—	—	—	2	—	—
23	Urinary infections	0	2	20	16	4	2	7	—	—	—	—	—	1	—	—
6	Meningitis	0	3	2	1	—	—	—	—	—	—	1	2	—	—	1
16	Skin abscesses, ulcers	1	3	5	5	5	—	—	—	—	—	—	—	1	—	—

TABLE IX. INFECTIONS FOUND AT AUTOPSY DURING 1958 (ST. LUKE'S HOSPITAL)
(Number Autopsies—364; Per Cent with Infections—40)

Site	Organism	Number of Cases	Per Cent Over 50 Years Age	Per Cent Medical Cases	Per Cent Surgical Cases
Bacteremia	Pure Staph.*	7	85%	80%	20%
	Mixed Staph.†	6			
	Others§	34	75%	75%	25%
Pneumonia	Pure Staph.	1	77%	80%	20%
	Mixed Staph.	20			
	Others	34	82%	90%	10%
Peritonitis	Pure Staph.	2	50%	50%	50%
	Mixed Staph.	2			
	Others	15	80%	60%	40%
Urinary tract	Pure Staph.	0	100%	100%	0%
	Mixed Staph.	2			
	Others	21	90%	70%	30%
Meningitis	Pure Staph.	0	67%	67%	33%
	Mixed Staph.	3			
	Others	3	33%	33%	67%
Skin	Pure Staph.	1	75%	75%	25%
	Mixed Staph.	3			
	Others	6	67%	50%	50%
TOTALS	Pure Staph.	11	77%	72%	28%
	Mixed Staph.	36			
	Others	113	79%	73%	27%

Among its records are those of surgical wound infections (Tables V and VI). Comparative antibiotic sensitivity studies on the organisms isolated from hospitalized patients are important (Table VII). All infections found at necropsies should be studied as to etiology, frequency and types of diseases (Tables VIII and IX). Accumulated records of all hospital infections as to etiology and source (Fig. 3) are essential. Spot checking of numerous likely areas of contamination is a necessary function of the bacteriologist. It is only through the comparative study of these records that the medical staff can know what is or is about to happen to their patients in this struggle with our ever present staphylococci and enterobacilli.

Conclusions

Staphylococci are the prolific, rugged, and versatile opportunists among the bacteria parasitizing man. With their ancestorial roots growing deep in nature (saprophytes), with large numbers of progeny produced in many readily available ambulatory carriers and in a wide variety of infections easily accessible to the surface of the body and with a most unique ability to survive natural and man made environmental barriers, they represent a most formidable foe. Until man has found a successful antibacterial control of the staphylococcus, his best intelligent efforts will be matched against the ominous, innate adaptability of this organism which has made it the most important communicable disease of our time. A critical study and control of numerous details pertaining to medical practice, housekeeping procedures, paramedical techniques and the development, maintenance and publication of epidemiologic records have become a necessary function of every hospital medical staff.

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Management of Urinary Stress Incontinence

Because of its extensive social and psychologic implications, the problem of urinary stress incontinence is of utmost importance to the unfortunate women so afflicted. This article is a general review of the surgical management of this distressing condition.

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THE hundreds of operative technics devised to cure stress incontinence of urine not only indicate that no single operative or medical method of management of the condition has been completely satisfactory but also indicate that what is known of vesical physiology and the pathophysiology of stress incontinence is poorly understood.

Cystographic studies of the incontinent patient by various techniques, although they represent only static, single phases of the rapid complex mechanism of micturition, have demonstrated various anatomic displacements such as descent of the vesical base and the urethra, funneling of the bladder neck, loss of the posterior urehtrovesical angle, and urethral shortening. Each of these anatomic changes has been considered at one time or another to be the primary cause of stress incontinence. We now know, however, that only about 85 per cent of the patients with stress incontinence demonstrate such displacements of the vesical neck and that, conversely, many patients with considerable prolapse, including some with cystourethrocele, are entirely continent. Rapid serial radiography, as devised by Ardran, and others,[1] the cinefluorographic studies of Lund and associates,[2] and the studies of Youssef and Mahfouz[3] and also of Lapides[4] and co-workers[5] have clarified our thinking considerably.

The investigations of Lapides,[4,5] which appear to have been largely overlooked in gynecologic circles, have been particularly noteworthy with respect to normal vesical physiology and sphincteric function. As a result of these studies and others mentioned above, one can state that the primary deficit common to all patients with stress incontinence of urine is relaxation of the internal involuntary vesical sphincter. Irrespective of the presence or the absence of the posterior urethrovesical angle, displacement of the vesical neck, and cystourethrocele, which are merely manifestations of prolapse (Youssef and Mahfouz[3]), the proximal urethra (that is, the internal sphincter) is relaxed and atonic in all patients with this form of incontinence. The role of the voluntary or external sphincteric mechanism, although important, is entirely secondary and compensatory. It is called into play when the resistance provided by the internal sphincter is inadequate and has been overcome by increased intravesical pressure. Thus understood, severe stress incontinence necessarily implies some attenuation of the external sphincter in addition to that of the internal sphincter. This is best indicated clinically by the ability of perineal exercises (Kegel[6]) to restore continence to some women even though these exercises of the voluntary perineal muscles could have little effect on the atonic smooth muscle of the involuntary internal sphincter.

Despite numerous anatomic descriptions of the internal sphincter, its exact location and function have remained rather obscure. For practical purposes, as Lapides[4] remarked, the terms internal sphincter, female urethra, and bladder neck can be considered synonymous. The smooth muscle of the urethra is continuous with that of the bladder, has a nerve supply derived from the same source, and is developed from the same embryologic origin. The internal sphincter therefore consists of

a tube composed of smooth muscle that functionally is part of the bladder proper. The formerly held concept of reciprocal innervation and function of the detrusor urinae and proximal urethra (internal sphincter) appears to be erroneous.

Lapides[4] has pointed out that the resistance to flow in a tube such as the urethra depends upon the inherent tension in the walls, the length of the tube, and the radius of its lumen. That this principle can be applied to the urethra and the subject of stress incontinence is suggested by a number of observations.

1. The continent patient has an elongated, high-placed urethra with good tension in its walls (an inherent property of the smooth muscle of which it is composed); and when this tension is adequate the urethral lumen has a radius of zero.

2. The incontinent patient has a shortened urethra with proximal dilatation, funneling, posterior flattening, and with little inherent tension in its walls. These characteristics may be of unknown cause, as in the incontinent nulliparous or even virginal patient; or they may be secondary results of childbirth injuries, postoperative scarring and fixation, postmenopausal attenuation of the supporting tissues, or other etiologic factors.

3. When the urethra has been excised or lost for one reason or another and an artificial urethra is constructed from a bladder flap of smooth muscle, the patient is continent of urine, provided the urethral tube constructed is 3 or more cm. in length. A tube of this length, although devoid of extrinsic innervation, has sufficient inherent tension in its walls to maintain continence.

4. Surgical experience also leads one to agree with this concept of internal sphincter or urethral function that is dependent upon the length, diameter, and tension of the urethral walls. To be successful the operative technique must result in elongation and elevation of the urethra and in some narrowing of the urethra lumen. Whether this is accomplished by stretching the urethra from above—suprapubically (as described by Marshall and others[7]), from below by periurethral fixation and urethral advancement (Berkow[8]), by vaginal elevation and constriction of the urethrovesical structures (Kelly and Dumm,[9] Kennedy[10]), or by a combined abdominovaginal technique (Ball[11]) is of little importance so long as the afore-said objectives are achieved.

The surgical treatment of the incontinent patient should be directed toward permanent correction with a single operation of as many of the urethrovesical abnormalities as possible. Operations must be individualized. The extent of the operation should be determined primarily by the degree of incontinence and the degree of urethrovaginal prolapse and displacement of the bladder neck. Additional consideration should be given to such factors as failure of previous surgical procedures, vaginal stenosis, urethral shortening, scarring and fixation, and the presence of obesity, chronic bronchitis, asthma, and so on. To use a single operation for all patients with stress incontinence regardless of these factors, as many surgeons formerly did, is obsolete. Equally outmoded is the thought that, "If this operation doesn't work, we then can do a Marshall or sling operation; and if that doesn't work we can do something else—or refer the patient elsewhere." The most favorable opportunity to cure the patient exists at the time of the primary operation.

The patient with slight incontinence, who might be a suitable candidate for a simple Kelly operation, frequently can be managed equally well by nonsurgical measures that may include exercises, estrogens (for individuals whose stress incontinence first appears in postmenopausal years), and the eradication of mild inflammatory processes (cicatricial and granular urethritis, trigonitis) which may precipitate or aggravate mild incontinence. Experience at this clinic indicates that the apparent initial rate of cure of 85 or 90 per cent obtained with the Kelly operation gradually deteriorates to between 50 and 60 per cent as the years pass. For this reason I infrequently perform the Kelly[9] operation alone, although its desirable features are incorporated into various other techniques.

At present the Kennedy[10] operation, combined with vaginal hysterectomy or another operation for prolapse, is the procedure perhaps most often used for moderate degrees of urinary stress incontinence. Although it cures approximately 85 per cent of the incontinent patients initially, approximately 25 per cent of the patients subjected to a Kennedy repair primarily for stress incontinence eventually require additional treatment. For this reason my colleagues and I have tended in recent years to perform more extensive surgery at the time of the primary operation, especially for those patients with severe or recurrent incontinence, the obese, those with bronchitis and so on,

who we know constitute the majority of the operative failures.

In cases of moderate to marked incontinence, I frequently resort to some supplementary procedures to provide increased elevation and more permanent support for the vesical neck.[12] At one time, I used the Ingelman-Sundberg technic,[13] which consists of—in addition to Kennedy plication—mobilizing the anterior half of the pubococcygeus muscle on each side and bringing these muscle slings under the neck of the bladder for additional support. Although this works satisfactorily, at times considerable bleeding may be encountered laterally. For that reason, I now use the technique described by Pacey,[14] which consists of passing sutures through the anterior portion of each pubococcygeus muscle and approximating these tissues beneath the bladder neck without severing them laterally. In addition, the medial fibers of the bulbocavernosus muscle can be approximated to provide further support and to advance the urethral meatus somewhat. If the pubococcygeal portions of the levator muscles are brought together anteriorly, as Pacey[14] suggested, one must be extremely careful not to approximate the levators too high in the posterior colpoperineorrhaphy, for otherwise the vagina will be unduly constricted.

If one vaginal plastic operation has failed to cure a patient, the chance that a second operation of the same type will do so is slight. As a rule, more extensive surgery is required. I consider the Marshall-Marchetti[7] operation (urethrovesical suspension) to be the operative procedure of choice for most patients with recurrent forms of urinary stress incontinence. If the patient has recurrent stress incontinence associated with some recurrence of a cystourethrocele or a short, fixed urethra, a combined operative procedure may be done to insure success. Frequently this consists of a Kennedy plication, with or without approximation of the pubococcygeal muscles, followed by the Marshall-Marchetti operation. If the urethra is considerably shortened and fixed by scar tissue, it sometimes is best merely to mobilize it vaginally without any attempt at plication from below. This facilitates the subsequent elevation and elongation of the urethra by the Marshall-Marchetti sutures.

Occasionally the Marshall-Marchetti operation is indicated as a primary operative procedure: (1) for patients who have severe urinary incontinence associated with vaginal stenosis—or at least with little evidence of cystourethrocele; (2) for patients in whom the presence of other pelvic pathology indicates the necessity for a suprapubic incision; (3) for patients with a congenitally short, dilated urethra; (4) as part of a combined abdominovaginal operation in some cases of severe urinary stress incontinence. From experience here, the Marshall-Marchetti operation, with or without supplemental vaginal repair, may be expected to cure the incontinence in about 85 per cent of cases, regardless of whether the operation is primary or secondary.[15] This operation entails much less technical difficulty and considerably fewer complications than do the various sling techniques. The period of hospitalization has averaged twelve days after the Marshall-Marchetti operation and almost twenty-three days after Millen-Read sling operations. The increase in the latter figure is due almost entirely to prolonged urinary retention, which has not been a problem following urethrovesical suspension. The Marshall-Marchetti operation has almost supplanted other suprapubic operative techniques in our use.

Perhaps there is a place—even though somewhat limited—for the fascial sling operation. Strangely, some of the patients who have a poor result from the Marshall-Marchetti procedure are benefited by a sling; conversely, in a number of cases in which sling techniques failed, cure was effected subsequently by the Marshall operation. The patient with recurrent stress incontinence and asthma, chronic bronchitis, or bronchiectasis also might be considered a suitable candidate for a fascial sling operation.

In concluding it may be said that a multitude of operative procedures are available for treatment of stress incontinence, any one of which will provide good results if the period of follow-up is relatively short. With passage of time and increase in the patient's age, the rate of cure obtained with many techniques steadily diminishes. I wish to reemphasize and encourage the present trend throughout the country to extend the initial operative procedure as necessary in the individual case to achieve the desired operative objectives of urethral elevation, elongation, and diminution of caliber. One should not try to fit the patient to a pet operative procedure. In many cases a combination of several vaginal or even abdominovaginal techniques may be necessary to obtain a cure that will stand the test of time.

(References on Page 1283)

Bronchial Closure with Tantalum Wire Sutures

The author presents his experience utilizing tantalum wire sutures for closure of the bronchial stump during pulmonary resection. The experience of others with various types sutures is also given. Tantalum wire and catgut cause the lowest incidence of suture granulomas and dehiscence or blow-out of the bronchial stump. The monofilament wire sutures indicate the site of amputation of the bronchus on postoperative x-ray examination.

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THE HEALING of bronchial stumps is one of the major factors influencing the results of pulmonary surgery.[1] Defective healing can be associated with two degrees of morbidity. The major complication is stump dehiscence (bronchopleural fistula). A more minor alteration is suture granuloma.

Dehiscence

Bronchial stump dehiscence is a postoperative catastrophe which may be difficult or impossible to control. The significant mortality or prolonged morbidity make this a dreaded entity to the patient and the thoracic surgeon. Dehiscence usually results from either uncontrolled infection, residual neoplasm, or technical errors in closure of the bronchial amputation.

It is axiomatic that a diseased bronchus heals poorly, if at all. Infection, whether extra-bronchial, endobronchial or intrabronchial, retards secure fibrosis with the resultant danger of "blow-out" from the intrabronchial pressure. Experience has shown that the type of suture used to close the bronchus is not the important factor in the prevention of such ruptures.[2] The vital factor is control of the infection.[3] Similarly, if a bronchial stump is involved with neoplasm, early or late breakdown and fistula result despite all efforts to avoid this.[4]

Technical errors are the outgrowth of carelessness or inexperience. Improper maneuvers on the stump include: (1) lack of coverage; (2) devitalization by high ligation of the bronchial arteries or skeletonization; (3) residual excess length with resultant stagnation of secretions; (4) the non-discriminating placement of suture material.

Suture Granuloma

This is an iatrogenic illness of known etiology. The usual features in a post-resection patient are an aggravating cough, recurrent hemoptysis, and often the production of the offending agent. Although usually more aggravating than dangerous, such granulomas are extremely serious at the site of tracheoplasties or bronchoplasties because of airway obstruction.[1,5] Another serious hazard is the nidus formation of active tuberculosis about infected sutures. Until the sutures are either spontaneously ejected or removed endoscopically or by thoracotomy, the symptoms persist.

Tantalum Wire Closure

To decrease the number of these two complica-

tions, every thoracic surgeon must carefully evaluate his method and material for bronchial closure. Therefore, I would like to present my experience in the use of monofilament 4-0 tantalum wire on atraumatic curved round needles (Ethicon) for closing the bronchial stump.

TABLE I. TYPES OF SURGERY

Neoplastic and Non-neoplastic Diseases	
Pneumonectomies	9
Lobectomies	28
Segmental Resections	63

One hundred consecutive pulmonary resections from July, 1955, to July, 1958, have been analyzed. Table I lists the types of surgery. Table II presents the complications postoperatively. Thus far there has been no dehiscence of the stumps or clinical symptoms of suture granuloma.

The method of bronchial closure has been the same in all cases. A short healthy stump (5 mm.) without injury to the bronchial vessels is developed. The proximal bronchus is occluded cartilagenous to membraneous portion by a Pott's non-crushing bronchus clamp. A single row of interrupted end over sutures 2-3 mm. apart and 2-3 mm. deep is placed beneath the clamp. Traction of these sutures effectively approximates the bronchial margins as the Pott's clamp is removed. Each suture is tied and cut "on the knot." After a negative-water seal test, the stump is covered by any convenient mediastinal tissue with a 4-0 chromic catgut suture.

The wire suture is used for all except the very distal bronchi; for closure of these, 5-0 arterial silk is used.

Discussion

The normal tracheobronchial tree is "sterile" of pathogens. However, after thoracotomy (or even abdominal surgery), the normal secretions stagnate in the finer ramifications of the bronchopulmonary tree because of splinting, narcotics, anesthesia, loss of cough reflex, etc. During the immediate postoperative period, no matter how "clean" the bronchi preoperatively, most patients raise grey to yellow sputum. This type of sputum often cultures hospital-strain resistant pathogenic micrococci, even though the patients have been hospitalized only twenty-four to forty-eight hours. As the patient re-institutes adequate ventilation and coughing, this sputum rapidly becomes clear, mucoid and eventually disappears. It is not difficult to visualize this intrabronchial flora gaining access to the bronchial stump and instigating a low grade or virulent infection about the sutures.

The ideal sutures for bronchial closure would therefore have the following characteristics: (1) have adequate prolonged tensile strength compatible with smallest bulk; (2) be relatively unaffected by surrounding infection; (3) have minimum reaction to host tissues; (4) have minimum tendency for knots to loosen; (5) be easily handled by the surgeon.[6]

TABLE II. POSTOPERATIVE COMPLICATIONS

Mortality and Morbidity

Death—1. Seventy-two-year-old Japanese man succumbed on the fifth postoperative day after resection right middle lobe for carcinoma. Autopsy revealed intact RML stump and massive CVA.

Complications—16 bronchopleural fistula (BPF)*

1. 2 BPF—following lobectomies for tuberculosis. Good result from closed chest tube suction. Air leak probably from alveolii.
2. 14 BPF—after segment resections for tuberculosis:
   (a) 9 BPF treated successfully by closed chest tube suction.
   (b) 2 BPF were alveolar air leaks because of inadequate lung volume to chest cavity (space problem). Successfully treated by apical tailoring thoracoplasty and closed chest tube suction.
   (c) 3 BPF required open thoracotomy and suturing of segmental plane alveolar air leaks. No leakage at bronchial stumps. Resulting clinical course uncomplicated.
3. No incidence of suture granulomas clinically: Majority of cases *not* bronchoscoped after surgery.

*The term "bronchopleural fistula" signifies a post-operative air leak from any source in the residual lung or bronchi.

The more common sutures utilized are the non-absorbable types (wire, silk, cotton, synthetic threads) and the absorbable materials (catgut).

Tantalum is an exceptionally good suture material.[7] Tissue response is minimal compared to the intense reaction to catgut. Surrounding infection is well tolerated, often without extrusion of the tantalum because of the metal's non-participation as a foreign body. This is not true of silk, and catgut is rapidly dissolved in the same circumstances. Tantalum is as strong as other materials and is more malleable than stainless steel. Although fibrosis is more marked, foreign body granulomas to tantalum are very rare and not emphasized by workers in experimental suture material studies. The cost is less than equal amounts of silk or catgut.

Other advantages of the monofilament tantalum wire in pulmonary surgery are absence of wick quality and visualization by x-ray. This pinpoints the site of stump amputation and therefore, stump length. Furthermore, if x-rays reveal dislodgment of a suture, the surgeon is alerted to a possible "blow-out."

The most serious disadvantage of wire suture is its rigid nature. It is a distinct possibility that erosion of a hilar vessel might occur. Dr. Conklin mentions this complication as having happened,

although not in his series. I have had no personal difficulties of this nature.

After several unsatisfactory experiences with silk suture granulomas, I found it easy to imitate the suture for bronchial closure of Dr. William Conklin of Portland, Oregon. Since 1943, Dr. Conklin and his associates have used the monofilament tantalum wire suture.[8] Conservatively estimated, they have performed 2,000 pulmonary resections.[8] The majority of these were for tuberculosis. There have been a number of stump ruptures, but Dr. Conklin believes that the basic problem has been uncontrolled infection or residual neoplasm rather than failure of the suture material. There have been no clinical cases of suture granulomas and therefore no need to endoscopically remove sutures.

Dr. Bjork,[9] after extensive experience with stainless steel wire, silk, and catgut sutures in resections for tuberculosis, now champions the catgut bronchial closure as best. Catgut sutures entirely avoid the problem of suture granulomas and the incidence of stump rupture is not increased (Table III). Bjork also thinks that the use of stainless steel wire results in as many granulomas as silk, and wire is more difficult to remove. Others[10] have also favored catgut as the best suture for bronchial closure.

Large series of pulmonary resections are presented in which silk or wire were used for bronchial closure. These authors do *not* mention the incidence of suture granulomas in their review. The occurrence of bronchopleural fistula is not unusual.[11,12,13,14,15] (For a more complete presentation of complication incidence, see Table IV).

Experimentally, rupture of the stump (independent of infection) is not influenced by the suture material but rather by the type of closure.[2] The end-over type closure with interrupted sutures reinforced by "pleuralization" is the strongest. Suture granulomas are definitely related to the material used and the method of placement. Monofilament tantalum wire and catgut are the least conducive to this complication.

TABLE III. INCIDENCE OF BRONCOPLEURAL FISTULA AND SUTURE GRANULOMA[9]

Pneumonectomies—Tuberculosis

Group I: Crafoord invagination technique but suture not described (probably silk).
Group II: Stainless steel wire *or* silk sutures used.
Group III: Chromic catgut *plus* silk sutures used.
Group IV: Chromic catgut sutures *only* used.

Group	Total Cases	BPF	Suture G
I†	65	1	4
II†	42	1	8
III	18	0	0
IV	21	1	0
	146	3*	12**

Lobectomies—Tuberculosis

Group	Total Cases	BPF	Suture G
I†	4	0	0
II†	113	3	17
III	55	0	0
IV	58	0	0
	230	3	17**

*Of these three cases, two had a subsequent wire bronchial closure and thoracoplyasty. Both died.
**These 29 patients had to have endoscopic removal of the offending sutures.
†Author also mentions that an additional five patients in Group I and Group II "coughed up" silk sutures but were not bronchoscoped. In three bronchoplasties performed with silk, all had to have silk sutures removed endoscopically.

TABLE IV. INCIDENCE OF COMPLICATION FOLLOWING PULMONARY SURGERY

Author	PN	LB	SR	BPF	D-BPF	SG	Suture
1. Metros	107	..... 555		0	0	0	Silk*
2. Sweet	61	80	0	1	1	....	Silk
3. Jones	18	13		2	....	....	Wire**
4. Lynn	.....	200		2	....	....	Silk
							Wire**†
5. Sherman	12	33	15	5	....	3	Silk
	12	33	15	3	....	0	Catgut
6. Chamberlain	0	32	210	5	5	0	Silk
7. Himmelstein	38	116	64	18	6	0	Silk
8. Brewer	164	159	0	14	3	0	T-wire‡
9. Keyes	0	3	1	0	0	0	T-wire
10. Nicks	3	tracheal	reconstruction	0	0	1	Silk

PN—Pneumonectomy
LB—Lobectomy
SR—Segmental resection
BPF—Bronchospleural fistula
D-BPF—Death directly resulting
SG—Suture granuloma

*Emphasizes silk is not to penetrate mucosa.
**Stainless steel monofilament wire with swedged needle.
†Used silk and wire. Two BPF were in silk closure. Also quotes world literature 7,750 resections, 520 BPF's (6.7%).
‡T-wire = Tantalum.

Summary

Suture material used for bronchial closure does not significantly influence the incidence of bronchopleural fistula. This complication results from residual neoplasm or uncontrolled infection in the bronchial stump. The incidence of suture granuloma in the bronchial stump is directly related to the type of suture used. Catgut and monofilament tantalum wire are the least conducive to granuloma.

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An Evaluation of the By-pass Graft in Arteriosclerotic Occlusive Disease of the Femoral Artery

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DURING the past ten years, a number of factors have combined to make arteriosclerotic occlusive disease of the lower extremities a commonly diagnosed and, because it is now treatable, important surgical problem. The development of simple and efficient diagnostic methods, adequate surgical techniques, prosthetic devices which are inexpensive and plentiful, and an increased knowledge of the occlusive arteriosclerotic process in general and its segmental distribution in some patients, all have been basic to this progress. In addition, the gradually increasing number of aged people has been accompanied by an increase in the number of patients with advanced arteriosclerotic disease. It is likely that the problem will continue to be numerically important.

Because of the clinical, pathological and surgical considerations which are peculiar to this area, it is logical to consider patients with femoral arterial occlusions as a separate group. The patient with femoral arterial occlusion is more likely to have severe distal arterial disease, and less likely to have developed adequate collateral circulation around the area of occlusion than the patient with aortic or iliac occlusion. In addition, since smaller vessels are involved, the surgical difficulties are greater, and increased likelihood of recurrent occlusion postoperatively results from a continuation of the arteriosclerotic process. For these reasons, the outlook for successful surgical treatment of the patient with femoral arterial occlusion perhaps should not be as optimistic as has previously been predicted.

The pioneering work in vascular surgery dates back to the experiments of Carrel.[1] In 1901, he performed end-to-end and end-to-side anastomoses using both fresh homografts and autografts. It was not, however, until 1951 that the first reports of clinical success with by-pass grafting procedures appeared. In that year, Kunlin[2] reported a series of seventeen patients in whom he performed a femoral by-pass procedure, using saphenous vein autografts in all but one case (in which an arterial homograft was used). Both resection with replacement and by-pass techniques were attempted in this country soon thereafter.

Crawford and DeBakey[3] reported forty patients on whom femoral by-pass procedures were performed utilizing arterial homografts; of these, thirty-seven, at least initially, were successful. However, less success was reported by Linton,[4] who, in comparing the resection and by-pass techniques, reported a 60 per cent failure rate in a group of twenty femoral arterial resections, while in a group of fifteen patients treated with the by-pass technique, he reported an 87 per cent success rate (with maximum follow-up of eight months).

The advantages of the by-pass method were well summarized by Linton and include: (1) preservation of collateral vessels; (2) less dissection; (3) an easier and larger anastomosis; (4) a greater likelihood of long-term patency. For these reasons, in many institutions, the by-pass has largely supplanted the resection in the treatment of patients with occlusions at the femoral level.

While optimistic reports of excellent results with both resectional and by-pass techniques began to appear in the literature in increasing numbers, the discouraging report of Hoye and Warren[5] in 1956, is of considerable significance. In their group of twenty-nine patients with femoral grafts, there was a 70 per cent failure rate, and this was approximately equally divided between the end-to-end and end-to-side anastomosis groups. Both arterial homografts and venous autografts were employed.

Several other reports of relatively poor results have also been published. Hohf and others[6] reported a 58.9 per cent overall failure rate in fifty-six patients with iliac or femoral occlusions whom fabric prosthetics were used were subject to a 50 per cent failure rate.

The largest clinical series reported to date is that of DeBakey,[8] in which 317 patients with fem-

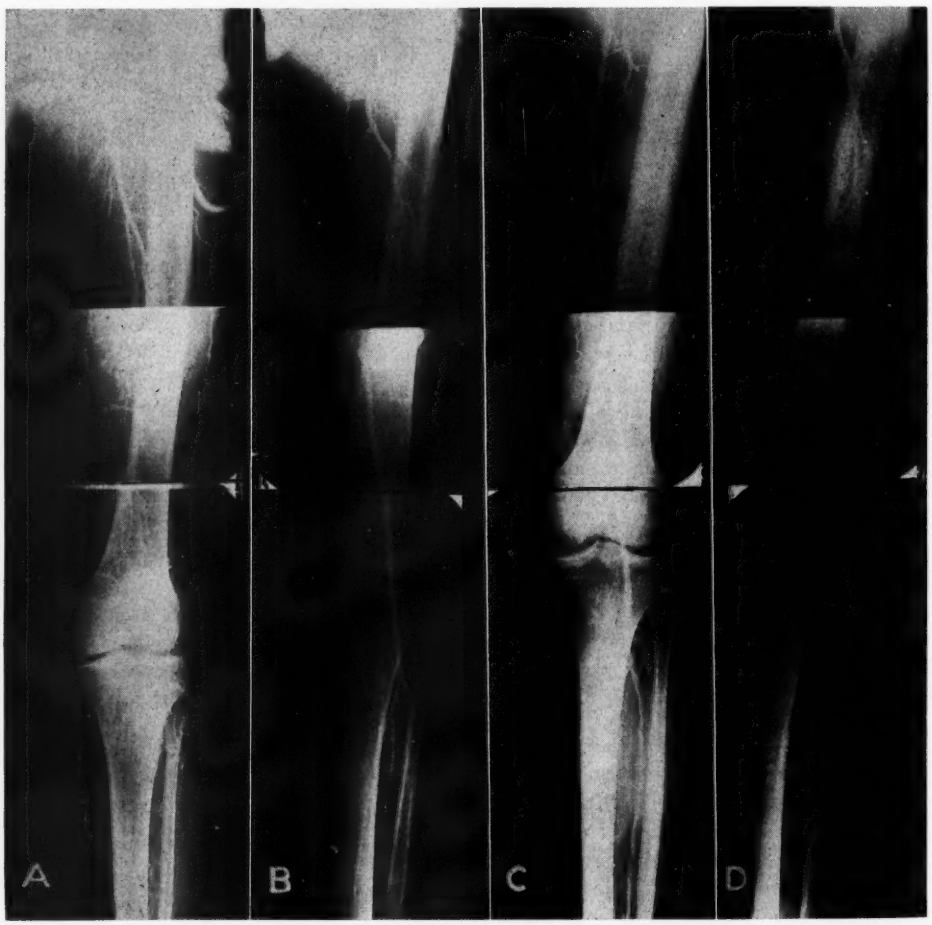


Fig. 2 (a) Femoral arteriogram in a patient with superficial femoral artery occlusion, and diffuse distal disease. No direct arterial surgery should be attempted in this type of case. (b) A long segment of the superficial femoral artery is occluded, but there is an excellent "run-off." Femoral by-pass was successful in this patient. (c) There is no complete block, but rather a diffusely diseased femoral artery, as well as occlusion of two of the three main vessels in the calf. Arterial surgery is not likely to be of much benefit. (d) A very long superficial femoral occlusion, with a patent distal arterial bed. By-pass was successful in relieving symptoms and in re-establishing pulsatile flow to the leg.

treated with by-pass operations utilizing arterial homografts and Edwards-Tapp nylon prostheses. The type of replacement material employed did not appear to affect significantly the eventual success rate.

Deterling,[7] in 1958, reported forty-nine cases of femoral-popliteal by-pass with a 28.5 per cent failure rate. In his hands, the homograft yielded an 80 per cent success rate while the patients in oral occlusions were treated with a by-pass procedure. There was an immediate 14 per cent failure rate and an additional incidence of 14 per cent late failures, of which approximately 7 per cent were salvaged by re-operation. Arterial homografts, nylon and dacron prostheses all seemed to yield essentially comparable results, although the present choice of DeBakey's group, for other technical reasons, is the dacron graft.

Enough experience has now accumulated to offer some guide to the vascular surgeon as to the probability of success in a given candidate for femoral by-pass. Since there is considerable confusion in the literature on this subject, it seemed worthwhile to review the experience of this clinic in an effort to determine the present accomplishment with this procedure, and to attempt to formulate a new set of criteria for operability. A clinicopathologic study was therefore made of all the cases in which femoro-popliteal by-pass for arteriosclerotic thrombo-occlusive disease was performed since the onset of such surgery in 1955. The period of this study ended in December, 1957, permitting a full year of follow-up on all patients.

TABLE I. AGE AND SEX OF THIRTY-NINE PATIENTS IN WHOM FORTY-TWO GRAFTS WERE PERFORMED FOR ARTERIOSCLEROTIC OCCLUSIVE DISEASE OF THE FEMORAL ARTERY

Age	Male	Female
40-49	3	1
50-59	3	2
60-69	12	5
70-79	8	2
80-89	2	0
90+	1	0
Total	29 (74.4%)	10 (25.6%)

Need for Treatment

It is important at the outset to outline the indications for surgical treatment in this group of patients. Massarelli and Estes[9] have clearly shown that the life of the patient with peripheral arteriosclerotic occlusive disease is not significantly endangered by this manifestation of his arteriosclerosis. While the survival rates for these patients are not as good as for the general population in the same age group, deaths are for the most part due to associated coronary and cerebral involvement. Occlusive disease is therefore in marked contrast to aneurysmal disease which poses the constant threat of rupture.

Incapacitating claudication is the primary indication for active surgical intervention in patients with peripheral arteriosclerotic occlusive disease. The delay or prevention of amputation in the patient with pregangrenous changes has been another indication. However, it is to be emphasized that, in the light of current results, the presence of an occlusive lesion alone is not sufficient justification to warrant surgery.

Clinical Experience

Forty-two femoro-popliteal by-pass grafts performed on thirty-nine patients constitute the clinical material reviewed in this study. The age and sex distribution of this group is summarized in Table I. As in most series of this type, the vast majority of the patients are males in the sixth or seventh decade of life. The incidence of associated diseases is indicated in Table III, and as might be expected, there is a high percentage of other manifestations of arteriosclerosis.

TABLE II. RESULTS OF FORTY-TWO FEMORAL-POPLITEAL BY-PASS PROCEDURES

Successful over 12 months	19 (45.2%)
Success continued to date	15 (35.8%)
Failures to date	
Death—operative	3 (7.1%)
Death later	7*
Amputation	
Within 6 months	7
After 6 months	2*
Graft occluded	
Within 8 months	7
After 8 months	2
Total	27

*Same patient.

All of the by-pass procedures were performed for arteriosclerotic occlusive disease of the femoral artery. In general, the grafts were placed from the common femoral to the popliteal artery. In eighteen cases an autogenous saphenous vein was utilized for the shunt, and in twenty-three cases an Edwards-Tapp crimped nylon prosthesis was used. One ivalon graft was employed. All of the cases were followed either until failure was evident, or for a minimum period of twelve months of palliation. While the failures are all well documented, several of the successes have only been contacted by letter. They are classified as successes because of persistent relief of preoperative symptoms, although no objective indications of graf patency are available.

TABLE III. CORRELATION OF ASSOCIATED CARDIOVASCULAR DISEASE WITH BY-PASS GRAFT FAILURE (BASED ON FORTY-TWO GRAFTS)

Condition	Success	Failure	Total
Hypertension (150/90)	7	14	21
Previous myocardial infarct	2	2	4
Previous CVA	0	2	2
Diabetes	0	6	6

Results of Treatment

Inasmuch as these patients have been operated on either for the alleviation of symptoms or to

postpone amputation, we have arbitrarily chosen a twelve-month period of palliation as sufficient to justify the procedure, and to classify such patients as successful.

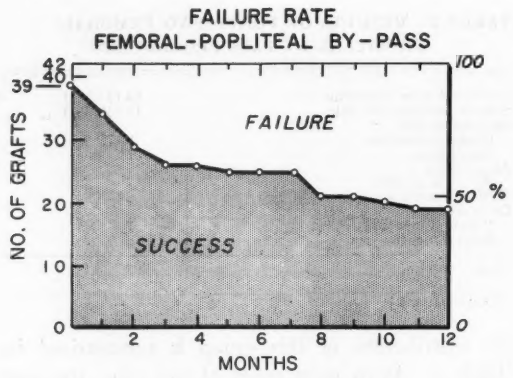


Fig. 1. Gradual decline in success following femoropopliteal by-pass is noted throughout the first post-operative year. However, most of the failures occurred during the first three post-operative months.

The results of these forty-two femoral by-passes are summarized in Table II. Nineteen, or 45.2 per cent of the patients, had twelve or more months of symptomatic relief following their operation. Four of these have subsequently developed evidence of graft failure (12 months, 15 months, 19 months, 23 months). The remaining twenty-three patients were classified as graft failures during the first post-operative year.

There were three operative deaths (7.1 per cent). Nine additional patients were subjected to major amputations following femoral by-pass on the same extremity. It is significant that whereas the greatest number of failures,[10] occurred during the first three postoperative months, there was a gradual increase in the failure rate through the first postoperative year (Fig. 1).

Discussion

In view of the high eventual failure rate of the femoral by-pass procedure at this clinic, an analysis of cause seemed indicated. For this reason, the clinical charts, operative reports and arteriograms of all of these patients have been reviewed, and an attempt has been made to redefine the criteria necessary for a chance of a successful end result.

Age and Sex.—A correlation of age with the eventual success of this procedure revealed that patients in the fourth and fifth decades of life as well as the very elderly patients (over seventy years) had a very low success rate. Indeed, there have been only two successful cases in the thirteen patients in this group who were over the age of seventy. Since this age also appears to be the upper limit of mortality-free elective abdominal aneurysm resection in this clinic,[10] it may well be a logical dividing line for elective surgery in patients with severe and diffuse manifestations of arteriosclerosis. Perhaps patients over seventy years should be excluded from consideration for this procedure.

There does not appear to be any correlation between sex and eventual graft success in this series.

Preoperative Duration of Symptoms.—Among eight failures treated within three months of the onset of their symptoms are five patients in whom gangrene was the indication for treatment. Of the total group of seven patients with gangrene, there has been one successful graft; one additional patient was successfully managed with a transmetatarsal amputation following by-pass. Four of these seven patients died, and above the knee amputation was necessary in the remaining case.

The group of patients treated for claudication appear to have a poorer prognosis with increasing duration of symptoms.

Associated Cardiovascular Disease.—Table III indicates the percentage of patients with associated arteriosclerotic disease in this series of thirty-nine patients. Note that none of the six diabetic patients had a successful result. On the other hand, Humphries[11] has reported successful results in diabetic patients. Neither of the patients with previous cerebrovascular accidents had a successful result. The percentage of hypertensives in this group of patients (53 per cent) is quite similar to the incidence (56 per cent) reported for patients with aneurysmal disease.[10]

Preoperative Arteriography.—The preoperative femoral arteriogram is probably the most important single item in the proper selection of patients for the by-pass procedure, and should be performed upon all prospective surgical candidates in whom no other contra-indication to surgery is present. In particular, the information gained from the arteriograms regarding the quality of the vessels proximal to the blocked segment, the length of the block, the number and size of the collateral

vessels, and most important, the status of the vascular bed distal to the obstruction, is invaluable. This information is frequently the sole basis for avoiding unnecessary explorations, while permitting surgery in the greatest number of suitable cases. To be of maximum value, the arteriogram must accurately delineate the degree of arteriosclerotic change in the distal arterial tree. Toward this end, the development of biplane femoral arteriography may offer some additional information as to the true status of the occlusive process, since a thin ribbon-like lumen may appear to be widely patent if x-rays are taken in only one plane.

A further adjunct in femoral arteriography at this institution has been the recent employment of serial techniques of a somewhat more precise nature than had been the previous custom. With a rotating casette holding four 7" x 36" films, four x-rays of the lower extremity may be obtained at any set interval. With this method, uniformly excellent angiograms, particularly of the distal arterial bed, have been obtained.

If complete arterial occlusion is present, and the collateral circulation is inadequate to fill the distal arterial tree, distal operative arteriography, as advocated by Barker,[12] should be employed at the time of popliteal artery exploration.

An indication of the importance of preoperative arteriography and its proper interpretation is revealed by the recent report of Wylie and Goldman,[13] in which they indicate that of 199 patients with clinical findings suggestive of femoro-popliteal occlusion, 61 per cent were inoperable because of extension of the disease into the distal popliteal artery, and diffuse disease in the proximal vessels.

The preoperative arteriograms of our patients were reviewed carefully with the above items in mind. In general, no new prognostic signs were discovered. However, the following findings should be noted:

1. In a number of cases the standard arteriogram did not show enough of the distal arterial bed to be diagnostic. In such cases serial or operative popliteal arteriograms should be done before by-pass is attempted.

2. In patients with poor arterial inflow and evidence of multiple partial blocks, poor results are the rule.

3. The patient with a single short segmental block and otherwise normal arterial tree was uncommon in our series. Most arteriograms revealed a considerable amount of arteriosclerosis in a number of the vessels.

4. The presence of a large number of collateral vessels, both proximal and distal to the block, is still compatible with a successful result, providing the main distal arterial channels are also patent.

5. The arteriogram frequently underestimates the length of occlusion and the degree of intimal involvement.

TABLE IV. CORRELATION OF TYPE OF GRAFT WITH BY-PASS FAILURE

Graft	Success	Failure	Total
Autogenous vein	10	8	18
Tapp-Edwards nylon	5	18	23
Ivalon	0	1	1
Total	15	27	42

Prostheses.—Ten of the eighteen patients in whom autogenous veins were implanted have remained long-term successes (Table IV). Only five of the twenty-three patients in whom Edwards-Tapp Prostheses were used have remained successful. This information correlates well with other reports of late occlusion with these grafts.[14,16] In addition, it raises the question as to the most suitable prosthetic device currently available. The reports of Szilagyi[15,16] and Barnes[17] have indicated the high failure rate which may be expected with the use of arterial homografts. In general, this is due to the variable acceptance of the homograft by the host and the eventual dilatation, tortuosity, aneurysm formation and rupture of an important percentage of arterial homografts. Autogenous veins may still have a place in this procedure. Linton[18] beileves the autogenous vein is the best graft currently available. Only a long term follow-up of a large group of patients will determine this.

Dacron and teflon are considered the most satisfactory materials for vascular prostheses at this time.[19] The work of DeBakey[20] and Szilagyi[16] involving the clinical use of dacron has been particularly satisfactory. The extensive laboratory studies of Harrison[21,22] have indicated that teflon is, at least on a physiochemical basis, probably the most suitable plastic presently available, and the initial clinical experience of Merendino and his co-workers[23] has also been quite satisfactory with this material. Both teflon and dacron are currently employed in this clinic.

Surgical Technique.—An additional factor of some importance is the variability of surgical tech-

niques employed for this procedure. Sixteen surgeons performed the forty-two femoral by-pass grafts reported here. There is little doubt that a carefully performed anastomosis and a limited and meticulous dissection considerably influence the eventual outcome of the procedure.

Summary

A group of forty-two patients in whom femoropopliteal by-pass has been performed is presented. Of these, nineteen patients have had at least twelve months of relief of symptoms and fifteen patients continue to have evidence of patent grafts.

Arteriosclerotic occlusive disease of the femoral artery is a slowly progressive condition which may lead to claudication, gangrene, and the eventual loss of a limb. The alleviation of symptoms is the only indication for direct arterial surgery in these patients.

More careful selection of patients for femoral by-pass must be employed in the future. The operative risk in patients with diffuse arteriosclerosis is considerable, even for relatively minor procedures. Patients over seventy years will rarely be candidates for this procedure. Patients with diabetes or gangrene were rarely benefited in this series.

The importance of adequate preoperative femoral arteriograms is stressed. The distal arterial bed must be shown to be patent by preoperative examination or by distal operative angiography for successful results to be anticipated. The use of serial angiographic techniques and biplane studies have been suggested as two methods of achieving this end.

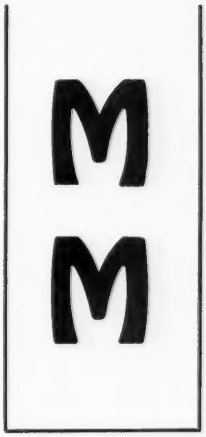
Teflon and dacron appear to be the most promising prosthetic materials currently available. The venous autograft still appears to have a place in the femoral by-pass procedure. There was a high incidence of occlusion with the Edwards-Tapp nylon graft in this series.

With more careful preoperative selection, better arteriographic evaluation, more meticulous operative technique, and more reliable prostheses, a greater number of good results may be expected in patients submitted to femoral by-pass in the future.

References

1. Carrel, A.: Surgery of the blood vessels. Bull. Johns Hopkins Hosp., 18:18, 1907.
2. Kunlin, J.: Le Traitment de l'ischemic arterique par la greffe veineuse longue. Rev. chir., Paris., 70:206-235, 1951.
3. Crawford, E. S., and DeBakey, M. E.: The by-pass operation in the treatment of arteriosclerotic occlusive disease of the lower extremities. Surg., Gynec. & Obst., 101:529, 1955.
4. Linton, R. R., and Menendez, C. V.: Arterial homografts: A comparison of the results with end-to-end and end-to-side vascular anastomoses. Ann. Surg., 142:568, 1955.
5. Hoye, S. J., and Warren, R.: Follow-up studies of iliofemoral arterial reconstruction in arteriosclerosis obliterans. N. England J. Med., 254:102, 1956.
6. Hohf, R. P., Trippel, O. H., and Laufman, H.: Clinical comparison of homografts and braided nylon in arterial by-pass surgery. Arch. Surg., 77: 552, 1958.
7. Deterling, R. A.: Experience with permanent by-pass grafts in treatment of occlusive arterial disease. A.M.A. Arch. Surg., 76:247, 1958.
8. DeBakey, M. E., Crawford, E. S., Cooley, D. A., and Morris, G. C., Jr.: Surgical considerations of occlusive disease of the abdominal aorta and iliac and femoral arteries: analysis of 803 cases. Ann. Surg., 148:306, 1958.
9. Massarelli, J. J., Jr., and Estes, J. E.: Atherosclerotic occlusion of the abdominal aorta and iliac arteries: a study of 105 patients. Ann. Int. Med., 47:1125, 1957.
10. Bernstein, E. F., Thal, A. P., and Varco, R. L.: Abdominal Aortic Aneurysms: Considerations in diagnosis and management. Minnesota Med., 41: 669, 1958.
11. Humphries, A. W., DeWolfe, K. G., and LeFevre, F. A.: Reversibility of pregangrene in the severely ischemic limb. J. Bone & Joint Surg., 40:983, 1958.
12. Barker, W. F.: Distal operative angiography as an aid in endarterectomy. Surgery, 36:233, 1954.
13. Wylie, E. J., and Goldman, L.: The role of aortography in the determination of operability in arteriosclerosis of the lower extremities. Ann. Surg., 148: 325, 1958.
14. Edwards, W. S., and Lyons, C.: Three years experience with peripheral arterial grafts of crimped nylon and teflon. Surg., Gynec. & Obst., 107:62, 1958.
15. Szilagyi, D. E., McDonald, R. T., Smith, R. F., and Whitcomb, J. G.: Biologic fate of human arterial homografts. A.M.A. Arch. Surg., 75:506, 1957.
16. Szilagyi, D. E., France, L. C., Smith, R. F., and Whitcomb, J. G.: The clinical use of an elastic dacron prosthesis. Arch. surg., 77:538, 1958.
17. Barnes, W. H., Ellis, F. H., Jr., Kirklin, J. W., and Edwards, J. E.: Experiences with 165 aortic homografts. Surg., Gynec. & Obst., 106:49, 1958.
18. Linton, R. R.: Peripheral vascular diseases. N. England J. Med., 260:272, 1959.
19. Creech, O., Deterling, R. A., Edwards, W. S., Julian, O. C., Linton, R. R., and Shumaker, H. B.: Vascular Prostheses. Surgery, 41:62, 1957.
20. Crawford, E. S., DeBakey, M. E., and Cooley, D. A.: Clinical use of synthetic arterial substitutes in three hundred seventeen patients. A.M.A. Arch. Surg., 76:261, 1958.
21. Harrison, J. H.: Synthetic materials as vascular prosthesis, I. A comparative study in small vessels of nylon, dacron, orlon, ivalon sponge and teflon. Am. J. Surg., 95:3, (Jan.) 1958.
22. Harrison, J. H.: Synthetic materials as vascular prostheses, II. A comparative study of nylon, dacron, orlon, ivalon sponge and teflon in large blood vessels with tensil strength studies. Am. J. Surgery, 95:16, 1958.
23. Merendino, K. A., Girvan, G. W., and Thomas, C. I.: The clinical use of teflon tubes as a vascular substitute for major arteries. Surgery, 43:959, 1958.

Tinnitus, Vertigo, and Deafness



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THIS title was given to me. I would not have been presumptious enough to have chosen it on my own; it is too big an order. In my own mind, I have modified it to read: What is there that is new about tinnitus, vertigo and deafness? These are time-worn terms. Every practitioner of medicine encounters these symptoms and knows that those afflicted can have real problems.

Tinnitus

Tinnitus may be defined as a sound experience perceived by the patient and which originates within himself. The word is derived from the Latin word "tinnire" meaning to jingle. A majority of those who have this symptom relate it to one or both ears and more commonly describe it as a singing sound, or a buzzing, or a sound like escaping steam and, less commonly, as a whistle—or actually as a sound as of a bell. Sometimes the patient cannot localize it and refers it to the center of his head. This suggests that the sound actually originates in both ears but because it is of the same pitch and loudness it is not referred to an ear; or, it suggests that the origin of the sound is not within the ear but arises in the neural mechanism of the central nervous system.

Etiology.—Figure 1 diagrams the location of the several causes of subjective tinnitus. These include: (1) pathologic disturbances in cochlear hair cells or ganglion cells from toxic causes, impairment of blood supply, et cetera, (2) the physical distortion of endolymphatic hypertension as occurs in Ménière's disease, (3) central nervous system disorders such as atherosclerosis or cerebellopontine angle tumors, (4) alterations of sound conduction from cerumen, middle ear fluid, otosclerotic fixation of the stapes, (5) vascular middle ear pathology such as inflammatory granulomata, extensive otosclerotic foci and carotid body-like tumors, and (6) clonic contracture of middle ear muscles.[1]

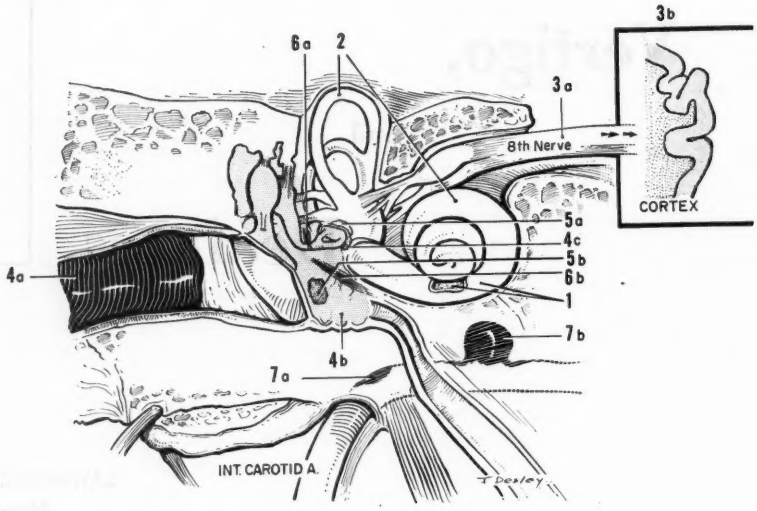


Fig. 1. A diagram (after Hilger) showing the sites for the etiology of tinnitus.

1. Pathologic alteration in cells of the cochlear sensory system
2. Endolymphatic hypertension (physical distortion of the cochlear sensory system)
3. (a) Certain disorders affecting the eighth nerve such as tumor
   (b) Certain disorders in the brain such as cerebral atherosclerosis
4. Alterations of sound conduction
   (a) from impacted cerumen
   (b) from fluid in the middle ear
   (c) from limited otosclerotic fixation of the stapes
5. Vascular middle ear pathology
   (a) vascular and extensive otosclerosis
   (b) carotid body-like tumors, inflammatory granulomata, et cetera
6. Clonic contraction of middle ear muscles
   (a) stapedius muscle
   (b) tensor tympani
7. Cervico-cranial vibratory phenomena
   (a) atherosclerotic narrowing
   (b) aneurysmal dilatation

(Through the courtesy of J. A. Hilger and W. B. Saunders Company).

Additional causes of sound in an ear may be one that the patient actually hears such as his own respiration in the form of a blowing sound past a constantly patent eustachian tube, or vascular eddying in a carotid artery due to aneurysmal dilatation or atherosclerotic narrowing.

A listing of the possible causes of tinnitus presents nothing that is new. As one reflects on these possibilities, however, it seems that a new emphasis

must be placed on the idea that "the patient is best served when the symptom of tinnitus is viewed in the broad medical sense as an indication for thorough-going otologic and general medical examination."[1]

The only positive treatment is the correction of the cause. In many instances the pathologic changes that have occurred are irreversible.

Vertigo

This symptom seems to be on the increase. As our knowledge has grown in recent years concerning the delicate neural mechanism in the membranous labyrinth that is concerned with equilibrium, and we consider the fact that the blood supply to the labyrinth is a terminal one without collateral circulation, an increased awareness of the possibilities of autonomic dysfunction has developed. This could explain many of the temporary vertiginous experiences for which no other cause is found.

Acute obstruction of a eustachian tube and the pressure changes that may occur when the patient relieves it by swallowing (or auto-inflation) may also produce an acute but transient vertiginous attack, because of acute pressures on the round or oval windows.

Etiology of the Major Sources of Vertigo.—There are five categories of etiology: (1) Cholesteatoma in a chronic middle ear and mastoid antrum in which the horizontal semicircular canal is eroded. (2) Disorders that are primary in the vestibular labyrinth, toxic causes such as the injury from streptomycin, viruses (mumps is a specific example) et cetera, and vascular causes. (3) Vestibular neuronitis (ganglion cell involvement). (4) Disorders within the eighth nerve from neoplastic growths or toxic neuritis. (5) Vertigo that is of central nervous system origin.

Vertigo can be classified into two types: *primary* and *residual*. In the primary type, the initiating stimulus originates somewhere in the vestibular system—usually by an active disease process—and occurs without relation to movement. In the residual type, an injury has occurred to vestibular sensory or neural elements disturbing their function and the vertigo occurs when a normally occurring vestibular reflex cannot function because of this defect. When the vertigo occurs as the result of the patient's movement such as tipping his head back to look upward or rolling over in bed, it is termed *postural* vertigo and if nystagmus is elicited on testing it is termed *positional* nystagmus.

"Residual vertigo then is evidence that injury has occurred in the vestibular system. This vertigo will continue as a response to movement until repair is complete or compensation occurs."[2]

Consideration of all of these possibilities in etiology should emphasize the importance, in the presence of this symptom, for a complete otological examination, and a general physical study including a neurologic evaluation. When these studies have been completed, the final diagnosis may be reached only by a process of exclusion. That is not true, however, in the severely disabling Ménière's disease. This disorder can be diagnosed from the history and by specific tests. The history is characteristic—such as aural pressure in the early stages, fluctuating hearing loss with relatively good preservation of the high notes in the early stages, tinnitus and paroxysmal attacks of vertigo, early loss of discrimination as determined by speech audiometry, and positive tests for recruitment.

Treatment.—Surgical therapy can produce a cure for the cholesteatoma. Removal of an eighth nerve tumor may also be curative. Ménière's disease usually responds to intensive therapy consisting of vasodilatation, limitation of sodium intake and diuresis, if the patient adheres faithfully to a strict regimen of therapy. Uncontrolled cases which are unilateral (a majority of them are) may be relieved by a relatively simple surgical procedure and bilateral involvement might be relieved in selected cases by streptomycin through destruction of the neural elements particularly vulnerable to the toxicity of this antibiotic.

Deafness

Otologists do not like the word deafness. There is a tendency to substitute the terms "hearing loss" or "hard of hearing" whenever possible and reserve the well-worn word "deafness" for the degree of loss which requires amplification for communication.

Medical students have been taught for years that the lesions involving the inner ear cause *perception* or *nerve* deafness. Improvements in the tests for hearing loss have made better differentiation possible in the location of the lesion and now we are substituting the term "sensory-neural" for those

terms previously used, inasmuch as the lesion may be anywhere from the end organ into the brain.

Considerable progress is being made in the cases of hearing loss caused by impairment of conduction.

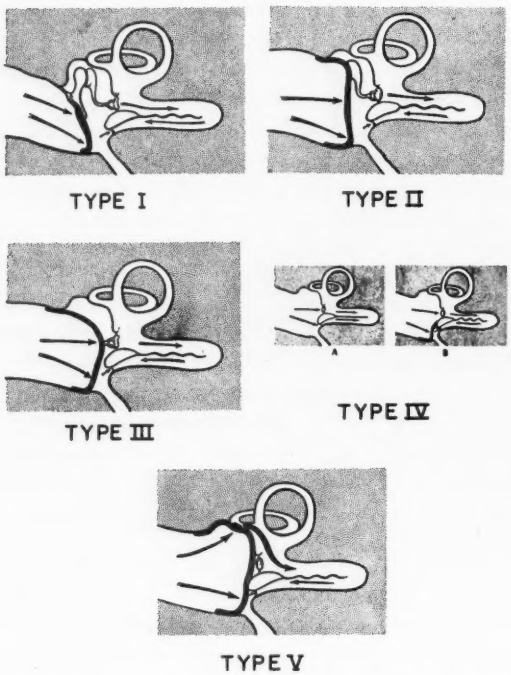


Fig. 2. Schematic representation (after Goodhill) of the types of problems encountered in the restoration of tympanic function damaged by chronic middle ear and mastoid disease. Type I consists of grafting an ear drum perforation and is designated as a myringoplasty. Type II is an expanded myringoplasty in which the malleus has been removed in the course of the disease, or by the surgeon, and the complete drum is replaced by a graft in contact with the incus. In Type III the stapes alone remains of the ossicular chain and the drum is completely replaced by a graft which contacts the stapes and a reduced air-containing tympanic cavity functions. In Type IV a small aid-containing cavity is created by a graft attached to the promontory extending over the tympanic orifice of the eustachian tube and attached to the outer inferior margin of the middle ear space. The stapes is gone in these cases but an oval window membrane functions. In Type V the oval window does not function and a fenestra is made in the horizontal canal. An extensive skin graft creates a minor tympanic cavity as in Type IV and also covers a newly created window in the horizontal canal. (Through the courtesy of Victor Goodhill and W. B. Saunders Company.)

Conduction Loss

Tympanoplasty.—The new surgical procedures done with visualization through a microscope, and grouped under the title of tympanoplasty, can restore useful hearing in many cases of damaged middle ear conduction mechanisms (Fig. 2). In fact, the term radical mastoidectomy is probably on the way out since these new procedures bid to replace the old techniques which in relatively few cases improved the hearing function.

The objective of the tympanoplastic procedures is to remove chronic suppuration, or the sequelae of this suppuration if the ear has become dry, and then to restore an air-containing tympanic cavity across which sound pressures can reach the inner ear, preferably by creating a mobile membrane that will be in contact with the remains of the ossicular chain. Limitations on what can be accomplished depend upon what is missing and the extent of cicatricial middle ear impairment. Needless to say, there is a vast reservoir of these cases to work on and it would seem reasonable to predict that as experience with these procedures increases, the successful results will increase.

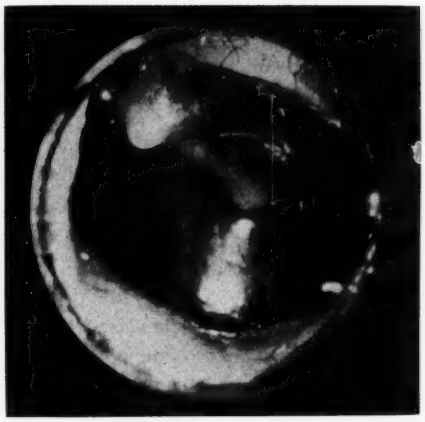


Fig. 3. Airless middle ear filled with dark hued serous fluid. This is due to eustachian tube obstruction. The ear drum is sharply retracted. The short process of the malleus is very prominent and the hand is drawn inward.

"Fluid" Ears.—Another activity that is common today and seems to be increasing is concerned with the management of what are rather loosely called "fluid" ears. Transudates of serum into the middle ear result from acute eustachian tube closure, with the transudate occurring when negative pressure of a sufficient degree develops in the tympanic cavity (Fig. 3). If this closure is temporary there is no particular problem. If it is initiated by an allergic or inflammatory change in the mucosa of the tube and an exudate fills the tympanic cavity, the character of this secretion makes resolution less

likely, particularly when the eustachian tube does not perform normally because of persistent edema within it or at either of its two openings. One example of this problem that is common today is the case of the child who develops an acute otitis media, has his upper respiratory tract "sterilized" by the use of an antibiotic, and three or four weeks later has a noticeable impairment in hearing and is found to have middle ears filled with mucoid secretion which when removed by aspiration through a myringotomy opening provides an immediate improvement in hearing. Untreated, or with the subsequent attacks that are also inadequately treated, these situations are prone to lead to permanently damaged middle ear function. The answer to this problem involves an adequate follow-up of the middle ear after an episode of acute otitis media, myringotomy for drainage when indicated, and attention to any abnormal conditions in the upper respiratory tract which affect the normal functioning of the eustachian tube. The number one offender in children is abnormal lymphoid tissue in the nasopharynx and oropharynx and the number two offender is probably allergy. The author has observed that chronicity in these middle ear problems is more likely to develop in temporal bones in which there is limited or practically absent pneumatization.

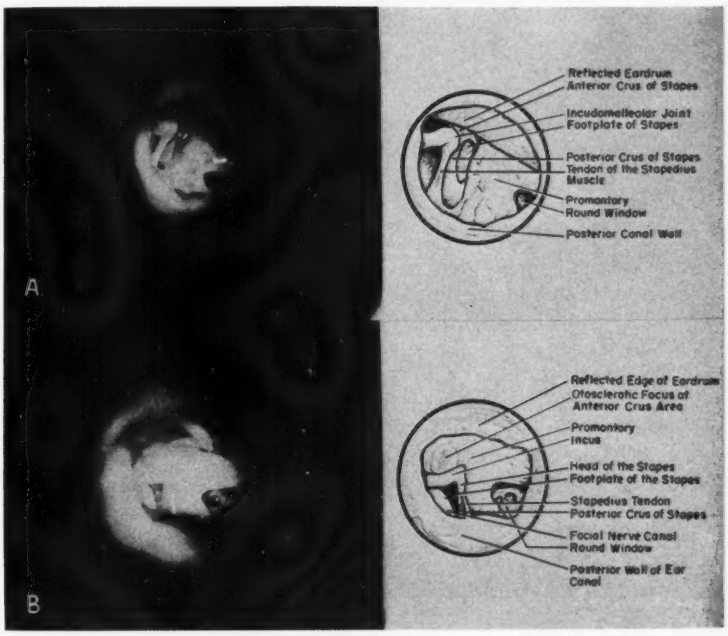


Fig. 4. (A) An actual photograph (after Hough) of what the eye may see through the operating microscope (Fig. 5) focused on the normal middle ear. (B) A case of otosclerotic growth in the area of the anterior crus. There are many variations in the extent of the otosclerotic growth. The one depicted here is an example of a case in which the chances of a successful result in stapes mobilization surgery is greater than it would be with a more extensive growth. (Through the courtesy of J. V. D. Hough and the W. B. Saunders Company.)

Otosclerosis

We have not learned anything that is really new about the etiology of otosclerosis in recent years, but it is probably safe to say that we have seen a lot more of it. There seems to be no evidence that it is on the increase but it is certainly diagnosed more often. The author believes that progressive hearing loss, with evidence that it is in the conduction mechanism, in the absence of evidence of middle ear inflammation must be due to otosclerosis. A generation or more ago, many of these cases were classified under the category of "chronic catarrhal deafness." The observations of those who have had a considerable experience with the surgery for otosclerosis would support these contentions.

The Surgery for Otosclerosis.—The operation that is known as the fenestration is not new but it has reached a high state of perfection in recent years as done in one stage. Also, the stapes mobilization operation cannot really be classified as entirely new since it was done over fifty years ago, but the techniques and successes are new. Under rather simply induced and adequate local anesthesia, the ear drum is reflected forward, some bone may or may not be removed from the posterior annular rim, and the incudostapedial joint and footplate area are visualized under microscopic magnification (Figs. 4 and 5). Then comes the problem of loosening the footplate without violating the integrity of the stapes and its joint with the incus. There is a great variation in the footplate conditions that the operator finds. In some, the growth produces only a limited fixation. The reason that the operation is at all successful when the mobilization is done through otosclerotic bone is that apparently a fracture through this type of abnormal bone tends not to heal.

Techniques have changed for improvement as experience grows. Many otologists now attack the footplate directly with picks or tiny chisels. Fortunately, the principal otosclerotic focus in a majority of cases is at the anterior crus (which is usually better visualized than the posterior crus) and a loosening of the ankylosed footplate at this site, a crurotomy or even a fracturing-loose of the posterior two-thirds of the footplate with a mobile posterior crus, may be attended by success. A variety of other procedures are now being tried in difficult cases such as an opening in the footplate covered with a graft and the substitution of an artificial stapes. In the present state of our knowledge and in the more experienced hands, permanent success is probably attained in approximately 50 per cent of the cases treated by surgery.



Fig. 5. The Zeiss operating microscope (Otoscope) perfected by Lempert is now widely used by otologic surgeons. Sterile drapes cover the parts adjacent to the field of operation; 6, 10, and 16 diopters of magnification are most frequently used; 40 diopters are available.

Relatively rare as a cause of interference with the conduction of sound pressures to the inner ear are the congenital conditions of the external ear. These vary in form from almost a completely rudimentary external canal and ear drum, along with malformations of the ossicular chain, to lesser degrees of these abnormalities. In some of these cases, surgical exposure of the middle ear and a skin graft to serve as an ear drum may substantially improve the hearing.

Sensory-Neural Hearing Loss

Relatively little can be accomplished in the treatment of hearing loss that has become established on a sensory-neural basis. Our hope lies in prevention. The one exception is with the lesion in the end organ previously referred to as "endolymphatic hydrops" or "endolymphatic hypertension." Some clinical manifestations of this are anything but new. Ménière gave an excellent description of them nearly a century ago. Early recognition of the disorder, and adequate and continued therapy may restore and maintain good hearing in many instances.

Aids to Hearing

Technical progress has advanced the performance and acceptance of the hearing aid. Currently so-called "hearing glasses" have a popular appeal and a binaural fitting has merit in certain cases. Small aids that fit behind the auricle or in a woman's hair with short communicating tubes to a flesh-colored plastic insert in the external canal are also popular. Some very small models have also been developed in which the whole mechanism is worn in the meatus of the external canal. The satisfactory use of these latter units may be accepted by patients in whom limited amplification is needed.

Additional progress that merits comment is the disposition of the modern otologist to know something about the prescribing of the aid for his patient. In the past, too much of this task has been left to hearing aid dispensers who have a heavy financial interest in the transaction. It is only natural that the handicapped patient whose hearing loss has led him to consult an otologist should expect specific directions and not confusion in purchasing help from representatives of the highly competitive hearing aid industry, many of whom participate in aggressive advertising.

Audiology

A new specialist has been accepted on the horizon of otology in recent years—one who has graduate college training in the problems of hearing and speech. In the author's opinion, the audiologist's major clinical contribution is in the measurement of hearing in the deaf infant and child and guidance of such patients in their education. An additional clinical function of the audiologist is in presiding over clinics for *problem* cases of deafness whose only chance for a workable means of communication lies in the use of a hearing aid. In performing these functions, research in the means of accurately assessing the degree of hearing loss and the location of the lesion has been another important contribution.

This new specialist in audiology should not be confused with the commercial "certified hearing aid audiologist" who sells hearing aids.

Summary

1. The symptom of tinnitus calls for an otologic examination and usually a subsequent thorough general medical examination.

2. A major vertigo problem is another otic symptom demanding thorough otological study and usually a neurological assessment should not be omitted. When a major problem, it is less often dependent on systemic disorder than is the symptom of tinnitus.

3. The term "sensory-neural" hearing loss is being substituted for "perceptive" or "nerve" loss.

4. Notable recent progress has been made in microsurgery on the middle ear to improve conduction losses due to damaged middle ear mechanisms and to mobilize the stapes in otosclerosis.

5. The otologist is assuming a more active role in guiding his deaf patients in the use of aids to hearing for which improvements have provided marked technical progress and increased acceptance. The audiologist who is trained as a specialist in speech and the measurement of hearing is proving to be a valuable member of the clinical team —particularly in the areas concerning education of the deafened child and in the rehabilitation of adults whose deafness will not respond to medical or surgical therapy.

References

1. Hilger, J. A.: Tinnitus. *In* Boies, L. R.: Fundamentals of Otolaryngology. Third edition. Pp. 126-130. Philadelphia: W. B. Saunders Company, 1959.

2. Hilger, J. A.: Vertigo. *In* Boies, L. R.: Fundamentals of Otolaryngology. Third edition. Pp. 131-143. Philadelphia: W. B. Saunders Company, 1959.

3. Boies, L. R.: Hearing loss. *In* Fundamentals of Otolaryngology. Third edition. Pp. 66 and 75. Philadelphia: W. B. Saunders Company, 1959.

Graphic Monitoring of Seizure Incidence Changes in Epileptic Patients

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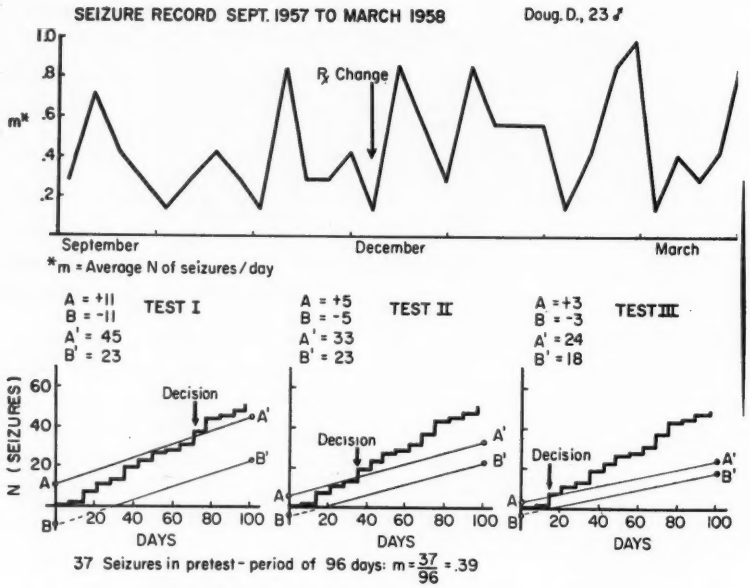


Fig. 1. Comparison of three sequential tests, applied at start of an apparently unsuccessful medication change.

IN PATIENTS with convulsive disorders, fluctuations in seizure frequency are common; the problem of the significance of these fluctuations is germane to the clinical evaluation of the course of the disease and particularly to research on anti-convulsant drugs. Pertinent statistical procedures were in the past, however, usually applied retrospectively, at intuitively picked intervals and to seizure data from groups of patients, rather than from individuals. The tests involved considerable computation and their uses remained limited mostly to research projects.

For medical practice, particularly in conjunction with anti-convulsant therapy, statistical methods seem desirable. How significant are the fluctuations of seizure incidence in a given case? This question constitutes a statistical facet of the clinical problem. It is related to the question: To what extent, if any, may seizure incidence changes be related to the use of a given drug? In attempts to obtain reliable answers, however, a third question arises: For how long should a certain medication be tried? This third question constitutes the main point of the following discussion; its ethical solution might involve, i.a., analytical statistical considerations.

Usually, the longer the period following a medication change, the better the chance to avoid erroneous decisions and yet, one may leave the patient on a useless or harmful treatment for too long. Also, one should not delay increasing a certain drug, first given in low doses, once its beneficial effect is ascertained. Whether a given medication should be continued, therefore, should be decided as soon as reliably possible. The significance of fluctuations in seizure incidence contributes heavily to the objectivity of such decisions,

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other things being comparable. These decisions will most likely involve error whether one waits too long or not long enough. Can one then predetermine the risk of error and thus reduce it to an acceptable degree?

In medical practice, answers to such questions have been sought intuitively, while reliable tests were unavailable or impracticable. Moreover, in practice, it does not suffice that a test be objective; its results must pertain to the individual patient rather than a group. Also, until decisions are reached, testing remains a constant problem. How often should one test? This depends upon seizure incidence. In selected cases, with many seizures per day, daily tests, including weekends and holidays, may be helpful.

Such requirements limit the choice of suitable techniques. Only an easy procedure may be used day after day. If the test is simple, however, its day-to-day performance may be assured by delegation to non-professional personnel. Furthermore, if the test is easily interpreted as well as easily performed by the same personnel, it can serve as a monitor (which is "automatic," as far as the physician is concerned).

Statistical tests applied with the foregoing thoughts in mind will be briefly sketched. Their limitations, some of them serious ones, will be noted. Within their limits, such tests may be monitors of change in seizure incidence and they may also help to make decisions as to the significance of incidence changes. The tests apply to certain (but not all) cases of epilepsy. Their usefulness in medical practice (and research) can be extended, however, to problems posed by disease other than certain convulsive disorders.

The procedure is graphic, it can be set up with minimal arithmetic and thereafter continued (done and interpreted) with *no* computation. The method involves sequential testing, a so-called "stop-go" scheme.

What is Sequential Testing?

Sequential analysis is a method of statistical inference whose characteristic feature is that the number of observations required by the procedure is not determined in advance; the decision to terminate depends at any time on the results of the observations previously made.[1] Sequential analysis was developed during World War II by Wald[1] and classed as a military secret. Since the end of the war, it has been widely used in industrial applications. Several biologic applications,[2,3] including clinical research[4-14] have also been discussed.

For clinical experimentation, Bross[4] has emphasized that sequential tests, as compared to the usual fixed sample procedures, offer three important advantages. First, data may be analyzed as they come in without necessarily waiting for analysis until the end of a fixed and often arbitrary period. Second, valid conclusions may be reached statistically with an appreciable reduction in the total amount of data collected. Third, Bross also noted that *all* computations on the part of a research worker may be eliminated. Lasagna and Meier[15] and in turn Armitage,[8,16] have emphasized the limitations as well as the advantages of sequential testing.

The Tests.—The theoretical basis for the particular procedures suggested below was developed by Dvoretzky and others.[17] These authors' formulae[17] were adapted to the problems of epilepsy and underlie the present methods.

Three simplified tests will be outlined for use in general and neurologic practice. The procedures will be denoted as Tests I, II, and III. With each of these (and with analytical statistics "built-in") one may arrive at one of two decisions: either a "reduction" in seizure incidence or "no reduction." These alternative decisions are made with the risk of error largely predetermined. Clinically, the decision "no reduction" in seizure incidence also is important as is the alternative "reduction." Either decision may stop a given treatment from being continued too long.

The three tests to be outlined differ in sensitivity of detecting a change in seizure incidence (as being statistically significant). They also differ in the time periods required for decisions, which are longer for Test I, as compared to Test II, and shortest for Test III.

Test I is very likely to detect a reduction of seizure incidence by as little as 25 per cent (i.e., to 75 per cent of previous seizure density). Tests II and III, on the other hand, are not very likely to detect changes in seizure incidence unless reductions by 50 per cent or by 75 per cent, respectively, have occurred.

Test criteria for the three procedures were chosen to meet the more common clinical needs with a minimal number of tests. Minor modification of the procedures outlined below will suffice, however, for more specific adaptations in particular cases and especially in research.

The predetermined risk of error with respect to a decision of "no reduction" (when reduction has occurred) is largest for Test III, intermediate for Test II and smallest for Test I. All three tests are so constructed, however, that the likelihood of erroneously claiming a reduction in seizure incidence (i.e., of doing so in case of no reduction) is less than 5 per cent.

Let α denote the risk of *erroneously* deciding "reduction" (when none has occurred) and let β denote the risk of erroneously deciding "no reduction" [when reduction by 25 per cent (Test I), by 50 per cent (Test II) or by 75 per cent (Test III) has occurred] (cf. 18). If the assumptions of Dvoretzky et al.[17] would be valid for each case of epilepsy tested, $\alpha=\beta=.04$, in the case of Test I; .03 in Test II; and .0154 in Test III. Actually, these values are approximations; the assumption of a truly random seizure incidence forms the basis of testing and it is unlikely that this assumption is strictly valid in most cases.

For those wishing to limit themselves to a single procedure, Test II may be recommended as the more generally useful method.

Variable Tested.—In cases with mixed seizure types, one may use a separate graph for each clinical type or a weighted seizure index instead. Clinically, the former more cumbersome approach seems the more appropriate. Testing might be restricted, however, to more prominent seizure types (for example, one may refrain from sequential testing in the case of petit mal attacks if most of them are likely to be overlooked).

Any evaluation of seizure data is as reliable as is the observation and interpretation of the seizures themselves. The nature of the variable plotted thus will be a function of the competence of the observers. From a statistical viewpoint the important point remains that the test deals with *changes* in number of observed seizures, rather than with the exact numbers of seizures as such. Thus, testing might be feasible if a certain number of seizures are missed (as may be the case even for grand mal seizures, particularly if they occur at night). A requisite for reliable testing is the comparable caliber of observation (for example before and after medication change), rather than an exact record of each seizure.

Requirements for Testing.—1. Seizure incidence (for example, as average/day = m) during an appropriate period prior to testing must be known or estimated.

The choice of pre-test period (the period selected for computing m) should be made with several points in mind, each of which is subject to qualifications. First, this period should be as close as feasible to the start of testing. However, when a lower seizure incidence was recorded prior to an ineffective change of medication, one may compute m for that earlier period (rather than for the subsequent but unsuccessful trial period). In other cases as well, one might deviate from the rule of using as the pre-test period the time elapsed between the last earlier medication change and the start of a new one to be tested. Among several successive periods on different medications, one may choose for computing m that with the lowest seizure incidence, unless such low incidence prevailed in conjunction with side effects that necessitated a change.

Next and only theoretically, the pre-test period ought to be sufficiently long so as to allow for establishing randomness by appropriate statistical tests[19-21] (see 2 below). In practice, however, periods of such length are not likely to be available and therefore, the statistical verification of the assumptions underlying testing usually will be lacking. One might merely note, in this connection, that the lower the seizure incidence, the longer should be the pre-test period and also that periods involving very frequent therapy changes should not be considered for computing m. One might stipulate that the period selected for computing m should be clinically representative, but this obvious requirement will have to be judged only by clinical intuition in many cases. Along related lines of thought, one might wish to consider cases for which written incidence records are unavailable. Whether or not in such cases one might use an m estimated by a custodian or institutional aide will depend largely on the confidence that one places in such estimates. It can hardly be overemphasized, however, that it is the validity of the estimate of m upon which the rigor of testing critically depends. This must be kept in mind, while we turn to the next point.

2. Seizure incidence should be superficially random (preferably ascertained as such from written records). If the seizures form "clusters," for instance, at certain times of day, the seizure pattern may be made artificially random by summation over one or a few days.

Unless other provisions (not discussed herein) are made, cases with "clusters" of seizures at

longer intervals (for example of several weeks around menstruation) may not be tested. It also may be impractical to apply these tests in cases with a relatively low seizure incidence unless plotting (see below) is done at longer intervals.

3. For the test period proper, arrangements should be made for the recording of seizures by a custodian at home or by an institutional aide.

Preparation of Graph.—1. Mark off *time* (in days) on a horizontal scale and the *number of seizures* vertically (see figures). Horizontally, day 0 is on the extreme left and day 100 on the right. The vertical scale is drawn as a function of expected seizure density, with 0 number of seizures placed at the intersection of the two scales; this scale is extended below the 0 point, for the placing of B [(2) below].

2. On the vertical scale, place points A and B, at +5 and —5, respectively, for Test II (see figures). (For Tests I or III, A and B will be at +11 and —11 or at +3 and —3, respectively).

3. Count number of seizures recorded during pre-test period. Express the pre-test incidence of seizures as average per day, to be denoted as *m*.

4. For Test II multiply *m* with 72, to obtain product P. (To obtain P in Tests I or III, multiply *m*, with 87 or 54, respectively).

5. Product P serves for computing A′ and B′. A′ is P + A and B′ is P + B. Thus, for Test II, P + 5 will be A′ and P —5 will be B′ (see figures). [In Tests I or III, use P + 11 and P —11 or P + 3 and P —3 (for A′ and B′), respectively].

6. Place A′ and B′ on the graph above the 100-day point on horizontal scale and at height indicated by vertical scale.

7. Draw straight lines connecting A with A′ and B with B′. The two lines should be parallel; they are the boundary lines for sequential testing.

Plotting of Seizure Line.—An intelligent custodian at home may be trusted with plotting. Otherwise, arrange for the reporting of seizures at suitable intervals (e.g., to the physician's secretary). Ward personnel also may be charged with plotting, but, in the institutional situation, reporting to the central office may be preferable. The higher the seizure incidence, the shorter should be the plotting intervals.

Plot a seizure line by starting at 0 days. During periods without seizures, move the line horizontally to the right, over a distance corresponding to the period plotted. During periods with seizures, move the line up, obliquely, to a point found by moving first horizontally to the right over the appropriate distance and then straight up, over as many units on the vertical axis as the number of seizures during that period. At any one time, the last point on this line (the seizure line) represents the observed seizures accumulated since initiation of testing.

In Figures 1, 2 and 3, a staircase is plotted; for practice, however, the oblique line, as drawn in Figure 4, may be preferred.

Interpretation.—The position of the last point on the seizure line in relation to the boundary lines is examined after each plot. If no boundary line is crossed, plotting is continued. As soon as a boundary line is crossed, the physician is notified. In the latter case, and within the limitations of each of the tests, one may make one of the following decisions:

(a) If the lower boundary line is crossed, one may conclude that there was a significant reduction in the patient's seizure incidence (as compared to the pre-test period).

(b) If the upper boundary line is crossed, one may conclude that there was no significant reduction in seizure incidence (as compared to the pre-test period).

As compared to an intuitive appraisal of the corresponding raw incidence data, such a test decision has a reduced chance of error. But the limitations of the test decision also must be emphasized. First, one must be content with the simple *yes* or *no* answer, for which the test was constructed (one does not obtain quantitative information as to the extent of change, if any).[15] Second, the test decision is based upon the behavior of a single variable.[8] Even though in certain cases of epilepsy the seizure incidence change might be a prominent variable, clinical decisions will depend heavily on other considerations as well. Finally, one must consider possible variations in seizure incidence that are coincident with a treatment change but that are not related to it, before one decides sequentially that a given treatment is better than another. But irrespective of these limitations and including the small percentage of erroneous decisions the test meets a real need since

it fulfills a monitoring function by focusing attention upon the patient. One may re-examine the patient at times of test decision, rather than solely at arbitrary intervals (other things being comparable). The clinical decision may justifiably be in discord with the test result; even so, testing may have served an important monitoring function.

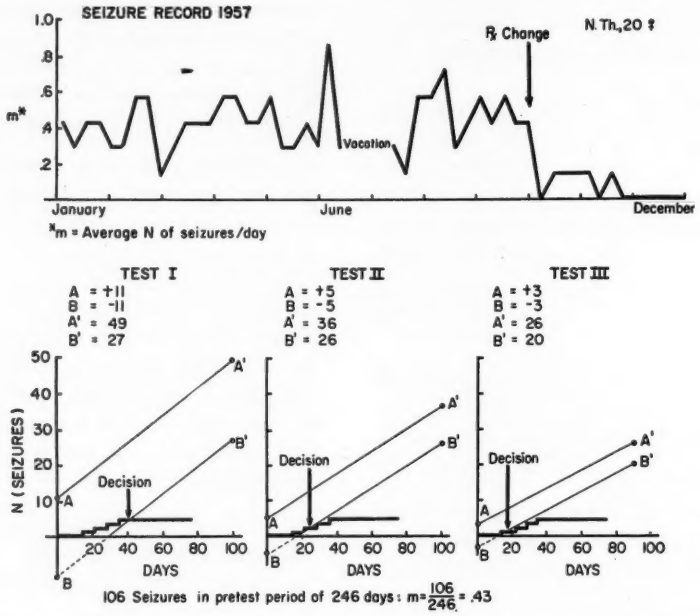


Fig. 2. Comparison of three sequential tests, applied at start of an apparently successful medication change.

Illustrative Examples.—In each of the figures, seizure data from a given patient are shown on top, with the time of medication change indicated by arrows. The tests deal with the significance of variations in seizure incidence during the period following the arrow (on top of the figures).

For comparison, in Figures 1 and 2, all three tests are applied to the same data. In Figures 3 and 4, Test II only is used. In the problem case of Figure 3, two different pre-test periods served for computing *m;* one of the computations obviously is invalid, since the requisite of superficial randomness was violated by pooling incidences during dissimilar periods (see below). In Figure 4, different medication changes are tested for their effectiveness in the same patient.

Test results are given in the bottom halves of the figures, arrows indicating the time when a test-decision was reached. In each case, the seizure line is continued after it has crossed the boundary line, to show that recrossing did not occur. In all cases, the test was applied retrospectively. For sequential testing in practice (which should be "prospective") *plotting must not be continued beyond the point of crossing.* Testing is completed when a boundary line is crossed; the physician should then be notified immediately.

Speed of Tests.—In comparison to Test II, Test III is faster in yielding decisions and Test I slower. In the case of Figure 1, for instance, Test III yielded a decision in less than twenty days, while Test II took about thirty days and Test I about seventy days (see arrows). In this case, the tests ascertained that the medication change was not followed by a significant reduction in seizure incidence since the seizure line crossed the upper boundary.

In the case of Figure 2, the tests ascertained a significant reduction in seizure incidence. Test III did so within 20 days, Test II took over 20 days and Test I almost 40 days.

In return for quicker decisions by Test III, one accepts a lesser degree of accuracy when seizure reduction is relatively small. The reverse holds true for Test I, while Test II is intermediate with respect to speed and accuracy. These differences among tests were ascertained in a retrospective study of 100 cases.

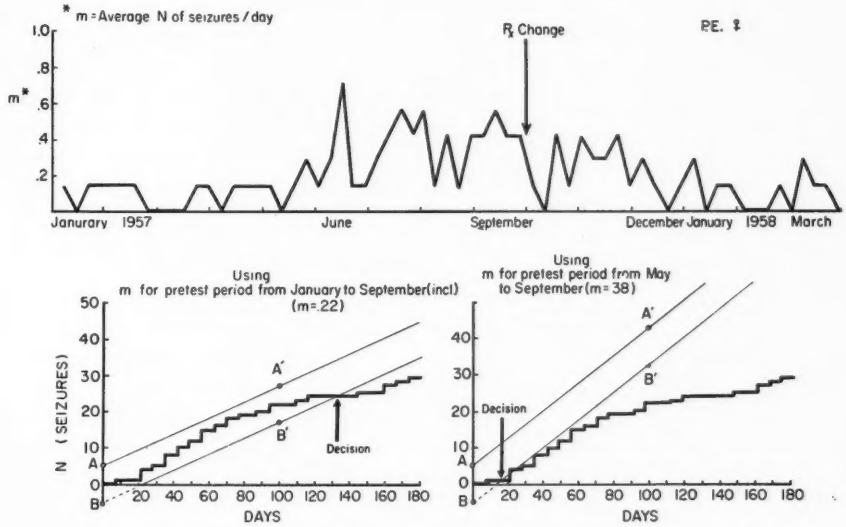


Fig. 3. Choice of an appropriate pre-test period—a critical and often difficult consideration in sequential testing (see text).

The advantages and disadvantages of the three tests should be weighed against one another, in each application. Test III, for instance, may be used in new cases, when a greater control of seizures is the aim of treatment and when frequent changes in therapy are warranted. Conversely, in cases remaining refractory in spite of many changes in medication, Test I may serve to ascertain a relatively small degree of reduction; in such cases it may not matter that the decision requires more time.

In most cases, Test II will be practical since it yields a decision regarding a substantial reduction in seizure incidence and since it usually does so within a reasonable time period.

Some Difficulties.—Irrespective of the test used, the selection of an appropriate pre-test period remains a critical problem. Superficially, the longer the pre-test period, the better. But significant changes in seizure incidence may occur quite independently from a change in medication or even in the absence of medication change. In the case of Figure 3, for instance, seizure incidence was higher after June 1957 than before. The decision of Test II was the same, whether the pre-test incidence was computed on the basis of the period from June to September or on the basis of the period from January to September. It was only the time necessary for test decision that varied as a function of the period used for computing m (the pre-test period incidence). This case illustrates some of the difficulties involved.

From a statistical viewpoint, it is not legitimate to pool seizure incidences before and after June, if as is the case, these incidences are significantly different. From a clinical viewpoint as well, this pooling cannot be sanctioned, since the mechanisms underlying any disease are subject to change in terms of progression or regression.

Moreover, fluctuations in seizure incidence such as those shown in Figure 3 (top) might be brought about by as yet questionable seasonal or other variations, not related to the medication change tested. From the viewpoint of practice, it seems debatable, whether in such cases repeated sequential tests on various therapies are worthy of application. Even if deemed worthy, sequential tests may be applied only if the occurrence of seizures

is superficially random, at least for a period of reasonable length.

Another difficulty may arise from a possible (untested) change in clinical seizure type after a change in medication. This will be no problem, however, if the different seizure types are separately recorded and plotted.

Finally, the occurrence of status epilepticus may be cited as a clinical circumstance necessitating immediate therapy adjustment, irrespective of test result.

What Sequential Testing Cannot Do.—A reduction in seizure incidence may be associated with behavior changes including sedation, with rash, jaundice or other side effects varying in kind and severity. An overall evaluation of the patient therefore remains indispensable, whether or not one tests sequentially. One may not exclusively rely on a statistical analysis of seizure counts in the care of convulsive disorders just as one does not rely solely on blood counts in treating certain blood dyscrasias. The sequential test may prove to be an important additional aid, but it is not intended to replace any of the standard professional activities.

What Sequential Testing May Do.—The advantages of sequential testing are twofold. Test decisions serve as monitor and they replace less objective decisions as to seizure incidence changes.

In a busy practice or in the often under-staffed institution, monitoring may prove to be as important as is decision-helping. In most hospitals, an important requisite for testing, namely the recording of seizures, is routine. The test allows much better use of such records, with minimal additional clerical work. This is illustrated with an institutional case in Figure 4, but the conclusions may also apply to patients treated in general practice.

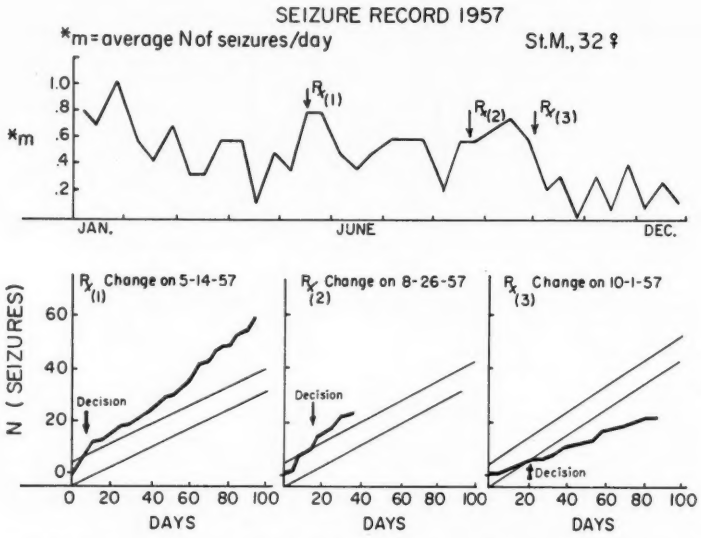


Fig. 4. A patient will not be left on a given medication for too long, if record is tested sequentially. Compare periods elapsed between successive intuitive changes in medication (top) with the shorter periods (bottom) required if sequential testing would have been applied (see text).

Following a first medication change tested in Figure 4, the seizure line crossed the upper boundary of Test II on the sixth day (that of Test III, on the third day and that of Test I, on the sixty-first day; these latter test results are not shown). The test decision (if it had been available) may have monitored a treatment change. The attending physician, however, did not intuitively change medication until over three months had elapsed. In other words, a change in medication might have been made much earlier if sequential testing had been carried out at the time of the medication change (rather than retrospectively, as was done in the case of Figure 4).

Following the second change of medication in

the case of Figure 4, the upper boundary of Test II was crossed after nine days (that of Test III after seven days, while Test I had not reached a decision until the thirty-first day; these latter test results are not shown). By thirty-six days following the second change in medication, it had become clinically obvious that no improvement had occurred and a third change in medication was instituted. Thereafter seizure incidence dropped promptly, and the seizure line crossed the lower boundary of Test II after seventeen days (that of Test III, after seven days and that of Test I after over thirty days; the latter test results are not shown).

Conclusions and Summary

Sequential testing may be used, i.a., in the care of certain (but not all) patients with convulsive disorders. Such tests serve as monitors of the presence or absence of a reduction in seizure incidence. Seizure frequency data need not be examined only at intuitively chosen, usually long intervals. The check for the presence or absence of changes in seizure incidence may be made frequently, if necessary daily, by means of sequential testing. Such testing is so simply done and interpreted that its day-to-day performance may be delegated to non-professional personnel. Thus, the test is automatic, as far as the physician is concerned.

The procedure is graphical; in simplified forms it may be set up with minimal arithmetic and thereafter it is carried out with no computation.

Three tests are described; as their speed in yielding decisions increases, their accuracy suffers (particularly in detecting relatively small reductions of seizure incidence).

The tests have limitations and they are not always applicable. When pertinent, however, sequential testing may provide more objective, rather than merely intuitive, decisions as to the significance of seizure incidence changes. The risk of erroneous decisions is largely predetermined and reduced to practical limits.

Test results help particularly in evaluating the efficiency of anticonvulsant medication; they may prevent given medication from being tried for too short a period or for too long a period.

Sequential tests must not replace any of the standard medical services, although they may appreciably aid treatment, as simple, graphic, monitoring and decision-helping tools.

References

1. Wald, A.: Sequential Analysis. New York: John Wiley & Sons, Inc., 1947.
2. Mortan, M. E., MacLeod, P., Anderson, E. O. and Bliss, C. I.: A sequential procedure for grading milk by microscopic counts. Conn. Agricultural Exp. Station, Bull., 276, 1951, pp. 1-35.
3. Macklin, M. T.: The use of the sequential analysis method in problems in human genetics. Am. J. Human Genet., 5-6:346-353, 1953-1954.
4. Bross, I. D.: Design for Decision. New York: The Macmillian Co., 1953, pp. 1-276.
5. Bross, I. D.: Sequential medical plans. Biometrics, The Biometric Society, 8:188, 1952.
6. Bross, I. D.: Sequential clinical trials. J. Chron. Dis., 8:349-365, 1958.
7. Kilpatrick, G. S. and Oldham, P. D.: Calcium chloride and adrenaline as bronchial dilators compared by sequential analysis. Brit. Med. J., 2:1388-1391, 1954.
8. Armitage, P.: Sequential tests in prophylactic and therapeutic trials. Quart. J. Med. (New Series) 23: 255-274, 1954.
9. Newton, D. R. and Tanner, J. M.: N-acetylparaaminophenol as an analgesic; a controlled clinical trial using the method of sequential analysis. Brit. Med. J., 2:1096-1099, 1956.
10. Wallenstein, S. L. and Houde, R. W.: Clinical analgesic assay of dihydrohydroxymorphinone. Fed. Proc., 15:1611, 1956.
11. Bartholomay, A. F.: The sequential probability ratio test applied to the design of clinical experiments. New England J. Med., 256:498-505, 1957.
12. Vallee, *et al:* Zinc metabolism in hepatic hysfunction. New England J. Med., 255:403-408, 1956.
13. Snell, E. S. and Armitage, P.: Clinical comparison of diamorphine and pholcodine as cough suppressants by a new method of sequential analysis. Lancet, 1:860-862, 1957.
14. Armitage, P.: Sequential procedures for medical trials. Biometrics, 14:132, 1958.
15. Lasagna, L. and Meier, P.: Clinical evaluation of drugs. Ann. Rev. Med., 9:347-354, 1958.
16. Armitage, P.: Sequential methods in clinical trials. Am. J. Pub. Health, 48:1395-1402, 1958.
17. Dvoretzky, A., Kiefer, O., and Wolfowitz, O.: Sequential decision problems for processes with continuous time parameter. Testing hypothesis. Ann. Math. Stat., 24:254-264, 1953.
18. Dixon, W. J. and Massey, F. J., Jr.: Introduction to Statistical Analysis. New York: McGraw-Hill, 1957, pp. 488, chapter 7, pp. 88-101.
19. Rao, C. R. and Chakravarti, J. M.: Some small sample tests of significance for a poison distribution. Biometrics, 12:264-282, 1956.
20. Barton, D. E. and David, F. N.: Tests for randomness of points on a line. Biometrika, 43:104-112, 1956.
21. Maguire, B. A., Pearson, E. S. and Wynn, A. H. A.: Time intervals between industrial accidents. Biometrika, 39:168-180, 1952.

Ocular Palsy in Temporal Arteritis

Medical Progress

Part I

DURING the past fifteen years, temporal arteritis has come to be recognized as a not uncommon affliction of the elderly. Its better-known manifestations include: severe headache, prominent, firm (often pulseless) extracranial arteries, pain on chewing, aching in muscles and joints, chilliness, impaired vigor, anorexia, loss of weight, low-grade fever, and an elevated sedimentation rate. The otherwise benign course of the illness is seriously complicated in some 50 per cent of cases by the occurrence of permanent, complete or partial, blindness in one or both eyes—caused, in all probability by inflammatory involvement of the central retinal arteries or the arteries supplying the optic nerves.

Recently, two cases of biopsy-proved temporal arteritis have been encountered at the Massachusetts General Hospital in which the opening phase of the illness was strikingly characterized by diplopia, ptosis and ocular palsies, and since headache was not a prominent feature in either case, the correct diagnosis was suggested only when marked impairment of vision supervened. The chief aim in presenting these two cases is to draw attention to the occurrence of ocular motor disturbances in temporal arteritis; however, in Case 1, there were additional features of interest—transient diabetes insipidus, pharyngeal edema, dysphagia, trismus, conjunctival edema, and periorbital swelling.

In making this report, the author has taken the occasion to review the general cerebral manifestations, not only of temporal arteritis, but also of the other more common types of systemic arteritis; in addition, a classification and description of the arteritides will be presented in outline form.

Case Histories

Case 1.—C.V. (966810) man, aged seventy-three; admitted April 18, 1957, discharged May 23, 1957.

Summary.—Over a period of three weeks, the patient successively developed fatigue, weakness, anorexia, headache, sore throat, and severe puffiness of the eyes and face. After admission, temperature ranged from 101 to 103° F. On the fourth hospital day, bilateral sixth nerve palsy appeared and also some involvement of the left third nerve. These improved rapidly but on the twelfth

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hospital day, the patient became totally blind in the left eye, and on the thirteenth day, partially blind in the right eye. Finally, severe diabetes insipidus occurred from the sixteenth to the twenty-second day. Biopsy of the left temporal artery showed a subacute arteritic process with lymphocytes, other mononuclear cells and many giant cells.

On admission, the patient complained of fatigue, weakness, anorexia, headache, sore throat, and puffiness of the eyes and face. On a background of extremely good health, he had first noted fatigue and weakness two months before admission. Three weeks prior to admission, fatigue was accentuated and severe anorexia developed. At the same time, a mild nonproductive cough appeared. Two weeks before admission, fluid collected in the olecranon bursa of the left elbow and 8 cc. of amber fluid were removed. Five days before admission, sore throat and difficulty in swallowing were noted. Headache began at this time and was chiefly occipital at first but later moved to the frontal region as well. Four days prior to admission, whitish exudate was found on the throat and penicillin therapy was given without benefit. Therapy was changed to Mysteclin V. The patient may have had a brief syncopal attack at this time. Two days before admission, the temperature rose to 100.4°. On the day of admission, the patient's face appeared puffy and both eyes "watered." There had been no illnesses of importance in the past and the patient was not predisposed to allergies. He neither smoked nor drank to excess.

Examination.—Temperature 101.6° F., pulse 100, respirations 22, blood pressure 160/90 mm. Hg. The patient appeared moderately ill and was extremely slow and feeble.

Severe conjunctival edema and mild periorbital swelling were present bilaterally, along with some redness of the tissues around the left eye. Visual acuity was normal and the visual fields were full. The pupils were equal and reacted to light. The extraocular movements were full without nystagmus. The fundi were not remarkable. The pharyngeal mucous membrane was swollen and slightly reddened but free of exudate. The teeth were carious and gingival pus could be expressed. Moderate trismus was noted and on opening the jaw, the upper and lower teeth could be separated only 3 cm. The salivary duct ostia were normal. The heart, lungs, abdomen, extremities and neurologic findings were not remarkable.

At the time of admission, an exact diagnosis could not be made but an infective or allergic process was suspected. The possibility of cavernous sinus thrombosis was also considered.

Laboratory.—Urinalysis shortly after admission was normal. An examination of the blood showed: hemoglobin 13.0 gm.; leukocytes 18,200 per cu. mm.; differential count—polymorphonuclear leukocytes 91 (band forms 1), small lymphocytes 4, monocytes 2, eosinophils 2;

platelets normal. A serological test for syphilis was negative. X-rays of the chest, paranasal sinuses, skull and colon were normal. Dental x-rays showed radiolucency around several teeth. A throat culture was sterile. A culture of the gingival pus showed moderate *Staphylococcus aureus* and alpha streptococcus. An electrocardiogram was within normal limits. Blood chemistry: nonprotein nitrogen 26 mg. per cent, blood sugar 121 mg. per cent, and sodium 138, potassium 5.6, chloride 92 and carbon dioxide 34, each in Meq. per liter.

Course.—During the first ten days in the hospital, the patient's general condition remained about the same, although the conjunctival and periorbital edema worsened slightly. The temperature ranged from 101 to 103° F. and the pulse was unduly rapid.

The patient vomited several times in the first twenty-four hours. During the next three days, headache, sore throat and cough abated to some extent but because of the persistence of fever and malaise, therapy with chloromycetin and erythromycin was started. On the fourth hospital day, impairment of ocular movements was reported. On examination, the temperature was 103° F. There was less periorbital swelling than on admission but the conjunctival edema had increased. The pupils were round, regular and equal at 2.5 mm., and reacted well to light. Boggy edema involved chiefly the lower half of each globe. On the left side there was no lateral movement of the eye beyond the midline, while on the right, abduction was limited to one quarter of the normal excursion. The left eye adducted incompletely and excursion downward was probably limited. Testing for diplopia with a red glass resulted in inaccurate responses. The clinical impression was involvement of the sixth nerve bilaterally and of the third nerve on the left.

Neurologic examination revealed no other definite evidence of involvement of the nervous system. The patient appeared to be normal mentally. There was no paralysis or numbness of the limbs. The tendon reflexes were normal and equal on the two sides. There were no meningeal signs and a cranial bruit could not be heard. The left nasolabial fold was questionably flattened and the gait may have been slightly wide-based. A lumbar puncture gave the following results: initial pressure 210 mm.; the cerebrospinal fluid was clear and colorless and contained 2 lymphocytes per cu. mm.; the total protein was 25 mg. per cent. The administration of pyribenzamine and adrenalin was of no avail. The trichinella antigen skin test was negative. Widal and Brucella tests were negative. Prostigmin did not improve the oculomotor power. Because of the earlier history of sore throat, 20,000 units of diphtheria antitoxin were given as a safety measure. Several urinalyses were normal.

There was little change for the next four days but on the eighth hospital day, abduction movements of the eyes were greatly improved, being almost full on the left. Improvement continued but on the twelfth hospital day, vision became severely impaired in the left eye and only form and motion could be discerned. There was relative sparing of vision in the upper nasal quadrant. Visual acuity in the right eye was perfect. There was mild but definite papilledema in the left eye, the right disc was normal. The left pupil was 3.5 mm. and failed to react to light directly but consensual reaction was preserved. The right pupil was 5 mm. and reacted well to light and on convergence. Lateral gaze was slightly limited bilaterally; upward gaze was questionably restricted. There was slight ptosis on the left. Again a suggestion of left facial weakness was noted. The remainder of the neurologic examination was not remarkable.

By the following day, visual acuity had become impaired in the right eye also (visual acuity 20/100), and perception of light in the left eye was now questionable. The presence of papilledema in the left eye was confirmed and definite pallor of the disc was described. The left pupil was still *miotic* and fixed to light directly but not consensually. Lateral and upward movements of the eyes were considered normal. The diastolic pressure in the central retinal artery was 22 arbitrary units, bilaterally. The temporal arteries were noted to be firm but not tender, and pulsations could be felt. The patient had had no headache since the second hospital day. On the fourteenth hospital day, vision was limited to the nasal field of the right eye, the left eye being totally blind. Ptosis and miosis on the left side continued.

Biopsy of the left temporal artery showed a moderately severe arteritic process with lymphocytes, other mononuclear cells and many giant cells lying in the media. A biopsy of skeletal muscle was not remarkable. Meticorten (60 mg. per day) was started and within a day or two the patient's general condition improved remarkably. The temperature fell to normal and appetite returned. The periorbital and conjunctival swelling subsided. There was little or no recovery of vision.

Two days after starting meticorten (sixteenth hospital day), the patient reported increased thirst and polyuria, and in twenty-four hours, the urinary output was 5000 cc. On the following day, the output was about the same and the specific gravity of the urine varied from 1.004 to 1.008. Plans were made to investigate, in detail, the patient's diabetes insipidus but due to his distress, a posterior pituitary antidiuretic preparation was given with complete but temporary relief. Twenty-four hours later, symptoms recurred but within another twenty-four hours, a "spontaneous" cure had occurred—the specific gravity climbing steadily from 1.005 to 1.012, 1.015, and finally 1.025.

Examination of the eyes on the sixteenth hospital day showed no change in the visual acuity, the left pupil continued to be small and fixed, and there was a left ptosis. The left corner of the mouth drooped. Meticorten was continued at 60 mg. per day. On the twenty-third hospital day, blindness was still total in the left eye, while in the right eye vision was limited to the upper nasal quadrant. The patient could read one-inch letters. He could see extremely well at a distance and could make his way around the ward satisfactorily. Orbital edema had long since cleared. The right optic disc was pale nasally; the left disc was still indistinct. The retinal vessels were healthy in appearance. The pupils were equal; the right reacted to light directly but not consensually, the left reacted only consensually. The extraocular movements were full in all directions and there was no nystagmus. The right temporal artery was prominent and firm but not tender. Pulsation was

scarcely perceptible. Facial sensation was normal. The throat and buccal mucosa was not remarkable. Neurologic examination was normal except as described above. The muscles of the limbs were not tender. There was no skin rash.

During the following twelve months, there was no appreciable change in vision but the patient's general health remained extremely satisfactory. Meticorten therapy was maintained for one year.

Comment.—In this case, the diagnosis of temporal arteritis seemed to be unquestioned on the basis of the biopsy of the temporal artery and the clinical course, especially the occurrence of severe impairment of vision bilaterally.

In regard to the involvement of orbital and intracranial structures, the following points should be noted: (1) Both sixth nerves were involved, and probably the left third nerve also. The oculomotor paralysis was transient and had greatly improved within four days and had cleared completely in six or seven days. Ptosis on the left side was noted by several observers. (2) The occurrence of severe damage to the left optic nerve followed within hours by signs of involvement of the right optic nerve, particularly its nasal half (temporal field deficit), suggested that the lesions might have been situated in the region of the optic chiasm. However, the presence of papilledema (albeit mild) in the left eye would favor a retrobulbar location of the disease process; furthermore, the diastolic pressures in the central retinal arteries, though equal, were probably low. There was virtually no late improvement in vision. (3) The occurrence of diabetes insipidus has not been previously recorded in temporal arteritis. It is postulated that the hypothalamus was involved adjacent to the optic chiasm. The duration of the diabetes insipidus was brief (six days). (4) One of the outstanding features in this case was severe periorbital and conjunctival swelling which at one time was of such a degree as to cause more than one consultant to attribute to it the bilateral limitation of abduction of the eyes. Although the picture resembled orbital cellulitis or cavernous sinus thrombosis, there was only very slight associated redness of the tissues and no venous distention or proptosis. Sore throat, dysphagia and trismus are uncommon complaints in temporal arteritis.

Headache was not a prominent complaint; furthermore, the temporal arteries pulsated well and were not tender. The arteries, however, were firmer than normal and it might be pointed out that in the healthy state, the walls of the temporal artery are almost impalpable when felt by the examining finger. Skilful palpation of these vessels will almost invariably enable the physician to determine the presence or absence of arteritis.

Case 2.—D. S. (959156) man, aged eighty-four; admitted February 12, 1957, discharged March 19, 1957.

Summary.—Progressive course over a period of six weeks of headache, ptosis, diplopia, bilateral third nerve deficit, blindness in left eye, and partial blindness in right eye. Biopsy showed giant cell arteritis of the left temporal artery. Symptomatic relief on Meticorten therapy. Vision failed to improve.

The patient's memory had been impaired for one year and for this reason, the details of the history were not as accurately determined as might be desired. About six weeks before admission, loss of vigor was noted, appetite failed, and mild headache appeared. Twenty days before admission, relatively complete left ptosis occurred and the left eye deviated laterally and upward. The ptosis cleared in about three days and the patient then complained of diplopia. Nine days before admission, vision failed in the left eye, and at that time examination by a neurologist showed evidence of involvement of the left third and fourth nerves. At no time was headache a prominent complaint. Within a few days, the left eye had become almost totally blind and vision in the right eye began to fail. On the day prior to admission, examination by Dr. M. P. Easton showed a visual acuity of 20/200 in the right eye and only light perception in the left. The left eye was divergent with weakness of medial rectus and inferior rectus, and questionable ptosis of the upper lid. There was weakness of the medial rectus of the right eye. There were no associated neurologic complaints such as dizziness, paralysis, numbness, ataxia, or speech disturbance.

The patient had had no previous illnesses of significance. There was no history of illness or arthritis. He had not been taking medicaments and he neither smoked nor drank.

Examination.—The patient, a vigorous elderly gentleman, was almost blind and, in addition, had severe impairment of recent memory. He did not appear ill although weight loss had been reported. He was extremely alert and cooperative. Although he had never complained of headache, when it was suggested that he had had no headache, he exclaimed, "My God, it's terrible, that's why I'm here. It's all over, but worse up here" (on pate). When asked to put his finger on the point of maximum headache, he placed it directly over the anterior branch of the right superficial temporal artery, 1.5 in. behind the outer corner of the eye. The patient spoke clearly and used language perfectly. There were no significant neurologic abnormalities except those involving the visuo-oculomotor apparatus.

Vision in the right eye was 5/50 (Snellen) while on the left, only very bright light was appreciated. In the right eye there was a temporal field defect, while nasally the visual field was greatly constricted, especially inferiorly. He could slowly read two-inch headlines but tended to hold the newspaper to his left.

There was bilateral ptosis of moderate degree. The pupils were equal at about 5 mm. The right pupil was round, the left oval. Neither pupil reacted to the brightest light but both reacted well on convergence. The failure to react to light was attributed (probably wrongly) to the recent use of mydriatics. On gaze forward, the patient sometimes fixed the object with the right eye and the left eye deviated laterally about one quarter of the normal lateral range, while at other times, fixation was with the left eye and the right eye deviated laterally. The ocular movements were easily performed but on conjugate lateral gaze, adduction of each eye was impaired by at least one quarter of its normal medial excursion. Gaze up and down was normal. There was no nystagmus. There was no orbital edema.

On examination of the fundi, the discs were somewhat yellowish but clearly outlined. One observer thought both discs were abnormally pale, but several others judged them to be non-atrophic. The vessels were perhaps attenuated and there was mild displacement of the veins by the arteries, but no occlusions were evident. There were no hemorrhages or exudates. The diastolic pressure in the central retinal artery on the right was 90 units; the left could not be accurately measured. The intraocular pressure was normal bilaterally.

The temporal arteries were conspicuous but not more so than in many elderly persons, and on both sides there were good pulsations. However, the arteries were firmer than normal. Heavy pressure combined with rolling the vessels under the finger produced only mild distress. The internal carotid pulsations were strong bilaterally and there was no intracranial or cervical bruit.

There was no facial weakness. Hearing was impaired bilaterally. On the Weber test, the sound of the fork was not lateralized. The tongue protruded in the midline. There was no stiffness of the neck. Motor power, coordination, and rapid alternating movements were normal in the limbs. Sensation was normal for pin prick, vibration, touch, position, and temperature. The tendon reflexes were sluggish but equal on the two sides. The plantar reflexes were flexor. The gait was not remarkable.

There was mild cardiac enlargement and a systolic precordial murmur was heard. The blood pressure was 200/110. Pulsation in the right posterior tibial and left dorsal pedal arteries was absent. The lungs were clear. The abdomen was negative. There was no skin rash or muscle tenderness. The temperature and pulse were normal.

Laboratory.—Urinalysis—no albumin or sugar, one erythrocyte, two leukocytes. Blood count—leukocytes 7,700 (polymorphonuclears 63, small lymphocytes 20, monocytes 11, eosinophils 4, basophils 2), platelets normal. Hemoglobin 11.4 gm. Blood sedimentation rate 56 mm. in one hour. The blood chemistry was as follows: nonprotein nitrogen 28, fasting blood sugar 89, cholesterol 151, each in mg. per cent; total protein 6.8, albumin 4.2, globulin 2.6 each in gm. per cent (A/G ratio 1.6); prothrombin activity 47 per cent.

Cerebrospinal fluid—initial pressure 80, crystal clear fluid, no cells, total protein 76 mg. per cent, colloidal gold 1111222110, Wassermann negative. X-rays: Chest—lungs clear, prominence of left ventricle; skull—no significant abnormality. Electrocardiogram: Nodal rhythm with occasional auricular and ventricular premature beats; borderline T wave changes. Isotopic test for cerebral tumor was negative. Electroencephalogram was within normal limits.

Course.—Because of the oculomotor paresis and the apparent absence of headache, the possibility that temporal arteritis was present did not come to mind immediately. However, when the presence of temporal headache became more definite on repeated questioning and the sedimentation rate proved to be elevated, a therapeutic trial with Meticorten was begun on the second hospital day, despite the patient's afebrile course. Within twenty-four hours, the patient's disposition improved, his head felt better, and appetite returned. Vision did not deteriorate further. On the seventh hospital day, biopsy of the left temporal artery showed chronic inflammation of the vessel wall. The media and adventitia contained a moderately heavy infiltration of lymphocytes and monocytes with occasional giant cells and polymorphonuclear leukocytes.

There was practically no recovery of visual function. Over a period of three weeks, it became possible for the patient to read one-inch headlines slowly with the right eye. Only bright light could be appreciated in the left eye. On about the fourteenth hospital day, the patient reported that for about fifteen minutes, vision improved dramatically so that he was able to see faces, furniture, and furnishings. There were no further such episodes. Because of the severe loss of vision in the left eye, coupled with a temporal field loss in the right eye, an arteritic lesion of the optic chiasm was suspected, and signs of damage to the adjacent hypothalmic region were watched for but none was detected (see *Case 1*). The pressures in the central retinal arteries were normal: right, 80/135, 85/135; left, 90/135, 92/137 (arbitrary units). By the fourteenth hospital day, both optic discs were becoming distinctly pale, and in the following months they became chalk-white. The retinal vessels remained unchanged. Useful vision was limited to the upper nasal field of the right eye.

The pupils continued to show no reaction to light but a good response on convergence. Twenty-four days after admission, the right pupil measured 5 mm., the left 3 mm. and both reacted slightly to light. The lids drooped less after approximately one week in the hospital. The extraocular movements were recorded as being full twenty-two days after admission, but it is likely that recovery in this respect had occurred earlier. Examination eleven months later showed no essential change in the visuo-oculomotor status. The right pupil measured 6 mm., the left 4 mm. Neither reacted to light but upon convergence there was a brisk full constriction. Both discs were extremely pale. The central retinal artery pressure on the right was judged to be normal by digital pressure.

Comment.—This was, actually, the first case encountered at the Massachusetts General Hospital in which temporal arteritis was associated with an

oculomotor paresis. Recovery from this particular deficit was fairly rapid and complete. The left ptosis, which was severe originally, improved greatly in a few days. The remainder of the third nerve deficit on the left improved further in the ten days prior to admission, and the bilateral limitation of adduction cleared in the week or two after admission. The pupils remained relatively unresponsive to light directly and consensually despite the persistence of a sector of vision in the right eye. There was no pain within the orbit. The patient's failure to complain spontaneously of headache, the lack of tenderness or enlargement of the temporal arteries, the persistence of pulsation in the vessels, the afebrile course, and the mildness of the general systemic disturbance are additional points worthy of note.

Discussion

A. Summary of the Literature Pertaining to Ocular Palsy

While British and French authors have referred to ocular palsy as a manifestation of temporal arteritis, the American literature makes only passing mention of it. Bruce[1] (1950) in his summary of the literature did not allude to cases in which diplopia and ptosis were features; however he was mainly interested in the incidence of blindness in the reported cases of temporal arteritis, which he found to be about 40 per cent.

Horton and Magath[2] (1938) noted diplopia in one of the seven cases they reported in 1938. In Case 2 of Dick and Freeman[3] (1940) the patient, a woman aged seventy-six, first had headaches for some five months followed by blurring of vision. Diplopia occurred for one week. Examination seven months after the onset revealed sluggish extraocular movements, poor vision in the right eye, and large firm, tortuous temporal arteries. In Murphy's[4] (1941) case, a woman aged seventy-one, experienced headache, swelling of the left jaw, painful chewing, and drooping of the left eyelid. Vision was apparently not affected (visual acuity had been impaired in the right eye for many years). Biopsy of the temporal artery showed a chronic inflammatory process containing giant cells. Ocular examination was normal.

Case 1 of Broch and Ytrehus[5] (1946) was a man aged sixty-nine who, following a period of headache and tenderness of the scalp, developed diplopia and ptosis, the latter appearing first on the left and two or three days later on the right. The temporal arteries were enlarged and pulseless. Examination showed an alternating divergent strabismus with diplopia in all directions. Ptosis was present on the right. Three weeks later slight ptosis was still present and eye movements were restricted. The ocular signs slowly improved but generalized pains appeared and the patient died from systemic effects approximately six months after the appearance of the ocular manifestations. The diagnosis of temporal arteritis, although not biopsy-proved, was almost certainly correct.

Cooke and his associates[6] (1946) reviewed the clinical findings in seven of their own cases of temporal arteritis and in thirty cases recorded in the literature. They found eighteen cases in which there was a visual disorder. These included diplopia (six cases), weakness of the extraocular movements (two cases), and ptosis (two cases). They suggested that the disease process must affect the arterial supply of the optic and ocular motor nerves in varying degree. In their Case 1, a man aged sixty-six, after experiencing headache, pains in the arms and legs, and tiredness for two months, found, on retiring one evening, that both eyes closed and he could not open them voluntarily. If he raised his eyelids with his fingers, he found he could see normally with the right eye but the left appeared as though there were a "black stream" falling over that eye. The bilateral ptosis lasted only twenty-four hours. One month later, he became totally blind in the left eye. Biopsy of the temporal artery showed a mild periarteritis.

In Case 2, a woman aged sixty-six, three months from the onset of her illness, began to have severe headaches; three weeks later, for a period of three or four days, she noted diplopia, the right-sided image being beside and slightly above the image of the left eye. At about this time, she noticed that the sight of the right eye failed and she became totally blind in twenty-four hours. Vision in the left eye was completely lost about one month later. Fundoscopic examination showed pale discs and thin arteries of uneven caliber. There was no oculomotor disturbance. The temporal arteries were tender but owing to the presence of numerous vesicles and crusts on the scalp, an arterial biopsy was not made. The clinical picture, no doubt, justified the diagnosis of temporal arteritis.

Case 3 was that of a woman aged sixty-nine who first developed pain, stiffness, numbness and wasting of the left thigh. A short time later, the right

thigh was similarly affected. Two weeks later, pain began in the right arm and the diagnosis of right axillary vein thrombosis was made. The left arm became similarly affected. Eight months from the onset, the patient began to have severe headache and ten days later, diplopia occurred for two days. Shortly thereafter, bilateral total blindness was precipitated. The discs were swollen and pale; the arteries appeared normal. The cranial nerves were normal, as was the remainder of the neurologic examination. One year later, she was still blind, her mental powers were impaired, and there was generalized muscular weakness. A biopsy of both temporal arteries showed a chronic destructive arteritis with multinucleated giant cells. The patient died two-and-a-half years after the onset of her illness and pathologic examination showed localized areas of inflammation affecting the arch of the aorta, the left subclavian artery, the distal aorta, and both femoral arteries. At these sites, the arterial wall was damaged to a variable degree; there was an infiltration of chronic inflammatory cells, including giant cells. The eyes were apparently not examined.

Case 6 was that of a woman aged seventy-three years who, after having had generalized muscle pains, loss of appetite and easy fatigability for eleven months, followed by headaches for five months, developed double vision lasting five minutes. Two days later she appreciated that she was blind in the right eye and within a few days the left eye also became sightless. Examination showed pale discs. The oculomotor function was normal. Biopsy of a temporal artery showed a giant cell type of chronic arteritis. The patient died fourteen months after the onset of her illness and pathologic examination showed marked softening of both optic nerves. In the aorta there were foci of infiltration of inflammatory cells of the media and adventitia with destruction of elastic tissue and muscle fibers. The superior mesenteric artery showed a similar inflammatory reaction, as did the right femoral artery. Both retinal arteries were equally affected. The lumen was obliterated by cellular fibrous tissue, obviously formed during the organization of a thrombus. The adventitia and media were infiltrated by lymphoyctes and plasma cells, and the internal elastic lamina was fragmented and calcified. A few giant cells were engaged in phagocytosis of these calcified fragments. There was no arteritis of the intracranial vessels.

Case 3 of Crosby and Wadsworth[7] (1948) was a seventy-nine-year-old man who, following sixteen weeks of headache, was admitted to the hospital because of sudden blindness in the right eye. Five weeks before admission, he had noted occasional episodes of blurred vision, and ten days before, he had had diplopia. Oculomotor examination was apparently normal.

Dick[8] (1948) described the case of a man, aged sixty-nine, who for one year had vague aching in the joints. Headache then appeared along with a "hard vein" in the left temple. Shortly thereafter, urinary retention occurred. Five weeks later, the patient became drowsy and confused. This lasted fourteen days during which period slight bilateral ptosis and weakness of conjugate upward deviation of the eyes appeared for one day. Biopsy of a temporal artery revealed the typical picture of temporal arteritis. In this case, it is not easy to interpret the oculomotor signs in view of the mental change which might point to involvement of the upper brain stem and in the absence of any other signs of orbital involvement.

Oculomotor impairment was described in more detail by Benard and his co-workers[9] (1949) whose patient, a woman aged seventy-seven, was admitted to the hospital because of headache, malaise and double vision. On examination the right globe appeared exophthalmic and the sixth nerve was totally paralyzed, the third nerve being partially paralyzed. Elevation of the lid was normal. The right pupil was slightly larger than the left. The fundus oculi showed narrowed vessels and traces of a recent peripapillary hemorrhage but vision was normal. Five weeks later, the patient suddenly became blind in the right eye. The temporal arteries were enlarged and tender, and biopsy showed a chronic inflammatory process including giant cells. The oculomotor palsies improved slowly and recovery was incomplete.

In Case 4 of Bessière and Julien[10] (1951), the patient was blind in the right eye and gave a history of a temporary paralysis of the right sixth nerve ten months before the onset of headache and the other symptoms of temporal arteritis. In view of the long interval, one might conclude that the relation of the ocular palsy to the arteritic process was not proved.

The patient of Cardell and Hanley[11] (1951) noted diplopia for four days before blindness occurred in one eye. On ocular examination two

days later, no ocular motor deficit was found.

Case 8 of Parsons-Smith[12] (1952) was a man, aged sixty-nine, who gave a four-week history of diplopia which was found to be due to weakness of the left inferior rectus muscle. The patient had had some left-sided headache during the previous two or three months. The diplopia disappeared in about four weeks. Biopsy of an occipital artery showed a nonspecific inflammatory change in the arterial wall. Visual acuity was not affected. This case illustrates the possibility of oculomotor signs existing when visual acuity remains intact. In his Case 9, the patient, a woman, aged seventy-three, complained of severe pain in both eyes. There was a long history of visual disorder (corneal ulcers, iridectomy, and glaucoma). She had severe hypertension (255/130) and severe headache. The occipital and temporal arteries were tender. The headache and pain in the eyes subsided within six weeks. Vision was not affected. A histologic examination of the arteries was not made, and a good deal of doubt concerning the diagnosis must remain. It has been included only to signify the possibility that pain in the orbit could conceivably be a manifestation of cranial arteritis.

Case 14 of Parsons-Smith, a diabetic woman of sixty-two, developed a severe stabbing pain in her left eye followed by diplopia, ptosis, and complete paralysis of the third nerve. Visual acuity was 6/6 in the right eye, 6/9 in the left. She experienced considerable pain in the left side of the neck, and the left temporal and occiptal arteries were acutely tender. A biopsy was not made. The "arteritis" and visual symptoms cleared in about two months. In the absence of histologic evidence of arteritis, one might well have made the diagnosis of diabetic ophthalmoplegia in this case, the clinical picture being very typical. The essential lesion in diabetic ophthalmoplegia is still not known, but in a pathologic study of the vessels running to the third nerve by Dreyfuss, Hakim and Adams[13] (1957) an arteritis was not found.

TABLE I. CASES OF TEMPORAL ARTERITIS WITH OCULOMOTOR INVOLVEMENT

Author	Symptoms	Signs	Duration
1938 Horton and Magath	Diplopia	—	—
1940 Dick and Freeman			
Case 2	Diplopia	—	1 week
1941 Murphy	Left ptosis	—	—
1946 Brock and Ytrehus			
Case 1	Bilat. ptosis, diplopia	Alternating strabismus, right ptosis	Slow improvement
1946 Cooke et al			
Case 1	Bilat. ptosis	—	24 hours
Case 2	Diplopia	—	3 to 4 days
Case 3	Diplopia	—	2 days
Case 6	Diplopia	—	5 minutes
1948 Crosby and Wadsworth			
Case 3	Diplopia	—	—
1948 Dick	Bilat. ptosis	Weakness of upward gaze	One day
1949 Benard et al	Diplopia	Right 6th, right 3rd (partial)	Slow incomplete recovery
1951 Bessiere and Julien			
Case 4	—	Right 6th	—
1951 Cardell and Hanley	Diplopia	—	? 4 days
1952 Parsons-Smith			
Case 8	Diplopia	Weakness of left inferior rectus	4 weeks
Case 14 ?	Diplopia, ptosis	Left 3rd	2 months
1953 Kendall			
Case 5	Diplopia, ptosis	Right 3rd	Partial recovery in 3 months
1954 Heptinstall et al			
Case 5	Diplopia	—	Transitory
Case 14	Diplopia	—	Occasional
1958 Fisher			
Case 1	Diplopia	Bilat. 6th, ? left 3rd (ptosis)	8 days
Case 2	Ptosis, diplopia	Left 3rd, slight right 3rd	2 to 3 weeks
Case 4 ?	Diplopia	Left 6th	6 months

In Case 5 of Kendall[14] (1953), the patient complained of double vision and complete closure of the right eyelid. Examination showed a complete paralysis of the third cranial nerve. Three months later, partial paralysis persisted with a dilated fixed pupil, incomplete ptosis and defective adduction of the globe. The temporal vessels were thrombosed and tender but a biopsy was not made. Transitory diplopia was mentioned in Cases 5 and 14 of Heptinstall and his associates[15] (1954). Wagener and Hollenhorst[16] (1958) reported that twelve of their 122 cases of temporal arteritis had diplopia sometime in their course but only three showed motor limitation at the time of examination.

In another personal case *(Case 3)*, the patient experienced diplopia in the course of an illness suggestive of temporal arteritis, but biopsy of the temporal artery failed to establish that diagnosis. The patient, aged fifty-four, had been treated successfully for cervical glandular tuberculosis twenty years before and had suffered from bilateral irido-

cyclitis with corneal scarring for fifteen years. Eleven months before admission, moderately severe persistent pain began in the neck, cheek and temple on the left side and six months later on the right side. Four months before admission, a sixth nerve palsy appeared on the right side and cleared completely in three weeks. Three days before admission, the patient became blind in the left eye. Biopsy of the left superficial temporal artery was negative. Meticorten therapy was started and within twenty-four hours head pain, which had been a distressing complaint day in and day out for many months, entirely disappeared. Vision in the left eye was partially restored. The presence of head pain, diplopia and blindness and the prompt response of the head pain to Metacortin, strongly favored the diagnosis of arteritis. There was no laboratory evidence of sarcoidosis.

B. The Clinical Picture and the Underlying Pathology

Although most of the case reports are brief and convey only a partial idea of the clinical manifestations, the following picture might be formulated: Ptosis, unilateral or bilateral, is most common and to this may be added more extensive damage to the third nerve or its branches, resulting in oculomotor palsy and diplopia. The sixth nerve, on one or both sides, is involved slightly less frequently. Oculomotor impairment does not always presage visual failure but in all cases in which both conditions occurred, diplopia or ptosis preceded the onset of blindness. Recovery from the paralytic deficit is, in most instances, prompt and complete, the symptoms and signs clearing over a period varying from several hours to a few weeks. The true incidence of oculomotor involvement is probably not reflected in the reported data because cases of cranial arteritis are no longer reported unless the illness presents unusual features. Furthermore, the dramatic occurrence of blindness overshadows other ocular complaints, and when vision fails, diplopia, of course, vanishes. From the data surveyed, the incidence of oculomotor involvement in temporal arteritis is estimated to be approximately 15 per cent.

The finding of diplopia in Case 8 of Parsons-Smith[12] and of ptosis in Murphy's[4] case, in the absence of any impairment of visual acuity, indicates that oculomotor palsy may occasionally be the only neurologic complication of temporal arteritis. A patient in whom a similar situation may have existed, has recently been seen by the author in consultation with Dr. J. Michelsen.

Case 4. F. B. (992646) man, aged seventy-four. The patient's only complaint was diplopia which had begun ten months previously and was slowly improving. Eleven months before, the patient, having been in excellent health, began to have severe pain in the temporal regions bilaterally and a little later in the upper jaw and zygomatic regions bilaterally. The pain persisted for about four weeks and as it subsided, diplopia appeared and persisted throughout the intervening ten months. On examination, there was obviously a partial paralysis of the left sixth nerve. The remainder of the general and neurologic examination was within normal limits save for the fact that no pulsation could be felt in the superficial temporal arteries, although pulsations elsewhere were excellent. The sedimentation rate was 42 mm. in one hour. As the patient was in no discomfort and the sixth nerve palsy was improving, biopsy of the temporal artery was not carried out. Admittedly in this case the evidence for an arteritis is tenuous, and the diagnosis is put forward with reserve.

The pathologic process underlying oculomotor involvement, although virtually unstudied, is presumably an arteritic involvement of the vasa nervorum supplying the ocular motor nerves, rather than primarily a myositis. In Cardell and Hanley's[11] case, several of the posterior ciliary arteries (which supply the ocular motor nerves) showed a marked intimal thickening and a diffuse cellular infiltration of all coats of the vessel wall with macrophages, lympocytes and a few plasma cells. In one artery, an occasional giant cell was seen. On the grounds of proximity, it might be anticipated that the process causing the oculomotor palsy is analagous to that responsible for blindness. In all, some seven histologic examinations have been made of the optic nerves and their vessels of supply in cases of blindness. In Cardell and Hanley's case, the lumen of the right ophthalmic artery was much reduced in size by intimal thickening and an organizing thrombus lay in the lumen. There were no changes in the wall of the corresponding central retinal artery, but the lumen was occluded by thrombosis. Both retinal arteries were equally affected in Case 6 of Cooke and his co-workers. The lumen was obliterated by cellular fibrous tissue obviously formed during the organization of a thrombus. The adventitia and media were infiltrated by lymphocytes and plasma cells, and the internal elastic lamina was fragmented and calcified. A few giant cells were engaged in the phagocytosis of calcified fragments.

Greenfield[17] (1951) described the pathologic findings in the eyes of a patient who had become

blind one month before. Histologically, the lesions of giant-cell arteritis were found in the retinal and ciliary arteries of both eyes and in the anterior coronary, internal carotid, middle and anterior cerebral, and anterior choroidal arteries, as well. The retinal and ciliary arteries were the seat of an intense angiitis which involved all three coats and reduced the lumen to a very narrow channel. The thickening of the intima was variable. Lymphocytic infiltration was present in all three coats but most intensely in the adventitia. The retinal arteries, after gaining their position in the center of the optic nerves, showed no destructive lesions of their walls, but there was considerable lymphocytic infiltration round them right up to the surface of the discs. Both optic nerves showed early degeneration of the myelin sheaths. No lesions were found in the central nervous system. Kreibig[18] examined the globe and optic nerve of an eye blinded fifteen days before in the course of an illness interpreted as temporal arteritis. Papilledema had been present and the arteries were slightly narrowed. Histologically, an extensive granulomatous arteritis involved the ophthalmic artery as far as its entrance into the optic nerve, at which point, signs of inflammation became minimal although some side twigs from the central retinal artery showed an infiltration with round cells. The lumen of the stretch of artery outside the nerve was occluded, while within the nerve the lumen was patent. A sector of the optic nerve just posterior to the lamina cribrosa was infarcted and contained fatty macrophages. The possibility that this lesion lay in the territory of a branch of the arterial circle of Zinn was raised, and the author was unable to explain the failure of retinal infarction to occur with total occlusion of the central retinal artery. He used the term "optikomalacia" to indicate the infarctive nature of the lesion.

In Case 12 of Heptinstall et al., a severe visual loss had been present clinically but no histologic evidence of arteritis was found in the ophthalmic or retinal arteries, nor did the optic nerve itself show any gross degeneration (autopsy fourteen months after onset of blindness). In their Case 14, in which bilateral blindness had occurred, giant-cell arteritis without vascular occlusion was present in both ophthalmic arteries and one showed fibrinoid changes in the media; the optic nerves showed little change but both occipital lobes were infarcted and the blindness may have been central in origin. In one case, Meadows[19] found evidence of arteritis and occlusion of the central retinal artery early in its course before it entered the optic nerve.

The patient reported by Lander and Bonnin[20] (1956) was a woman, aged seventy-five, with a typical picture of temporal arteritis who died nineteen days after the onset of bilateral blindness from pulmonary embolism. The characteristic picture of giant-cell arteritis was found in the right internal carotid (minimal), aorta, coronaries, and bilaterally in the superficial temporal, lingual, external carotid (minimal), and ophthalmic arteries. These last showed severe and advanced changes with complete occlusion of the small orbital branches. Wedge-shaped areas of softening, which, like the vascular changes, were more advanced on the left side, were present in both optic nerves; the central vessels of the retina showing only focal adventitial collections of lymphocytes. The site along the optic nerve at which the lesions lay was not stated. Some orbital branches showed unusual large plaques of calcification arranged concentrically in the media and sub-intima.

Whatever the process involving the ocular motor nerves may be, its evanescent effect on nerve conduction is in striking contrast to the permanent damage wrought by involvement of the optic nerves.

C. Additional Remarks Concerning the Two Cases Presented

1. *Diabetes insipidus.*—The occurrence of diabetes insipidus in temporal arteritis has not been previously reported. Although of brief duration in the case presented, the symptoms and signs were unmistakable and pitressin brought prompt relief. There were no other signs of hypothalamic involvement and the patient's mind was lucid at the time of the diabetes. Meticorten had been administered for two days. In Case 2 of Cooke and co-workers, the patient developed excessive thirst and polyuria but the course of these symptoms was not given and there was no additional evidence of hypothalamic involvement. Although a biopsy was not made, the case was undoubtedly one of temporal arteritis. Possibly, confusion and drowsiness (as in Dick's case) have their origin in this region. It has been our experience that victims of temporal arteritis give a very poor chronologic account of their illness but we have thought this was caused partly by cerebral decline associated with aging, and partly by the rather vague nature of the illness.

It is tempting to suggest that in the author's case the impairment of vision—total blindness on the left, and a temporal field defect on the right—resulted from damage in the region of the optic chiasm and that diabetes insipidus was caused by extension of the process to the supraoptic nuclei of the hypothalamus which lie in close proximity. If involvement of the region of the optic chiasm was a regular event in temporal arteritis, a ready explanation would be at hand for the striking occurrence in quick succession, in many cases, of blindness first in one eye and then in the other. Furthermore, it is of interest that each of the three patients with proved temporal arteritis described in this paper *(Cases 1, 2, 5)* was totally blind in one eye while the other eye showed an extensive temporal field defect and any remnant of vision lay in the medial part of the visual field—a pattern compatible with a lesion situated in one optic nerve near the chiasm and involving the adjacent medial fibers of the opposite optic nerve. Such a location for the lesion would explain why, in many cases, at the height of the blindness the retinal arteries not only show no visible evidence of an arteritis, but appear to receive an adequate supply of blood and show no reduction in arterial pressure as determined by ophthalmodynamometry. Pathologic examination of the chiasm in temporal arteritis has apparently not been made. It might be mentioned here that Boyd[21] (1943) referred to Zlotnikob who reported a case of periarteritis nodosa in which the patient had diabetes insipidus associated with peripheral edema, headache, vomiting, hypertension and retinitis.

Damage to the pituitary has been mentioned in three cases studied pathologically but the descriptions were brief. In Jennings'[22] Case 3, the pituitary gland "appeared necrotic," in Gilmour's[23] (1941) Case 3, there were small infarcts in the anterior lobe of the pituitary, and in Ritama's[24] (1951) case, "the hypophysis was disintegrating." In a case of idiopathic arteritis of the aortic branches, Marinesco and Kreindler[25] (1936) thought they were able to demonstrate changes in the pituitary gland to which they attributed the atrophy of the facial tissues.

The presenting picture in our Case 2—dysphagia, trismus, sore mouth, conjunctival and periorbital swelling and mild proptosis—was unusual in our experience and especially confusing because headache was of insignificant proportions. However, the literature contains a few other accounts of similar, although less striking, cases. Occasionally, pain deep within the nasopharynx may be the patient's only complaint in temporal arteritis.

References

1. Bruce, G. M.: Temporal arteritis as a cause of blindness. Am. J. Ophth., 33:1568, 1950.
2. Horton, B. T., and Magath, T. B.: Arteritis of the temporal vessels: report of seven cases. Proc. Staff Meet., Mayo Clinic, 12:548, 1937.
3. Dick, G. F., and Freeman, G.: Temporal arteritis. J.A.M.A., 114:654, 1940.
4. Murphy, J. R.: The syndrome of temporal arteritis. New York State J. Med., 42:2236,1942.
5. Broch, O. J., and Ytrehus, Ø.: Arteritis temporalis. Norsk. Med., 30:1251, 1946.
6. Cooke, W. T., Cloake, P. C. P., Govan, H. D. T., and Colbeck, J. C.: Temporal arteritis: A generalized vascular disease. Quart. J. Med., 15:47, 1946.
7. Crosby, R. C., and Wadsworth, R. C.: Temporal arteritis, Review of the literature and report of five additional cases. Arch. Int. Med., 81:431, 1948.
8. Dick, A. P.: Temporal arteritis (Giant-cell arteritis). Proc. Roy. Soc. Med., 41:379, 1948.
9. Benard, H., Rambert, P., and Pestel, M.: Artérite temporale et complications oculaires. Bull. et mém. Soc. méd. Paris, 65:1271, 1951.
10. Bessière, E., and Julien, R. G.: Les manifestations papillaires dans le syndrome dit "artérite temporale." Fréquence de l'oedème papillaire ischémique. Arch. d'ophtal., 10:701, 1951.
11. Cardell, B. S., and Hanley, T.: A fatal case of giant-cell or temporal arteritis. J. Path. & Bact., 63:587, 1951.
12. Parsons-Smith, G.: Ophthalmic manifestations of temporal arteritis. Brit. J. Ophth., 36:615, 1952.
13. Dreyfuss, P. M., Hakim, S., and Adams, R. D.: Diabetic ophthalmoplegia. Arch. Neurol. & Psychiat., 77:337, 1957.
14. Kendall, D.: Some complications of temporal arteritis. Brit. M. J., 2:418, 1953.
15. Heptinstall, R. H., Porter, K. A., and Barkley, H.: Giant-cell (temporal) arteritis. J. Path. & Bact., 67:507, 1954.
16. Wagener, H. P., and Hollenhorst, R. W.: The ocular lesions of temporal arteritis. Am. J. Ophth., 45:617, 1958.
17. Greenfield, J. G.: Discussion on some less common cerebrovascular diseases. Proc. Roy. Soc. Med., 44:855, 1951.
18. Kreibig, W.: Optikomalazie, die Folge eines Gefässverschlusses im retrobulbären Abschnitt des Sehnerven. Klin. Monatsbl. Augenh., 122:719, 1953.
19. Meadows, S. P.: Temporal arteritis and loss of vision. Tr. Opth. Soc. U. Kingdom, 74:13, 1954.
20. Lander, H., and Bonnin, J. M.: Giant-cell arteritis. Report of a case with autopsy. J. Path. & Bact., 71:369, 1956.
21. Boyd, L. J.: VII. The cerebral and ocular manifestations of periarteritis nodosa. Bull. N. Y. Med. Coll., 6:130, 1943.
22. Jennings, G. H.: "Temporal arteritis" some aspects of subacute arteritis in later life. Brit. M.J., 1:443, 1948.
23. Gilmour, J. R.: Giant-cell chronic arteritis. J. Path. & Bact., 53:263, 1941.
24. Ritama, V.: Temporal arteritis. Ann. med. Int. Fenniae, 40:63, 1951.
25. Marinesco, G., and Kreindler, A.: Obliteration progressive et complète des deux carotides primitive; accès epileptique. Considerations sur le role des sinus carotidiens dans la pathogénie de l'accès epileptique. Presse méd., 44:833, 1936.

(Part II will appear in the October issue)

Leiomyosarcoma
of Meckel's Diverticulum

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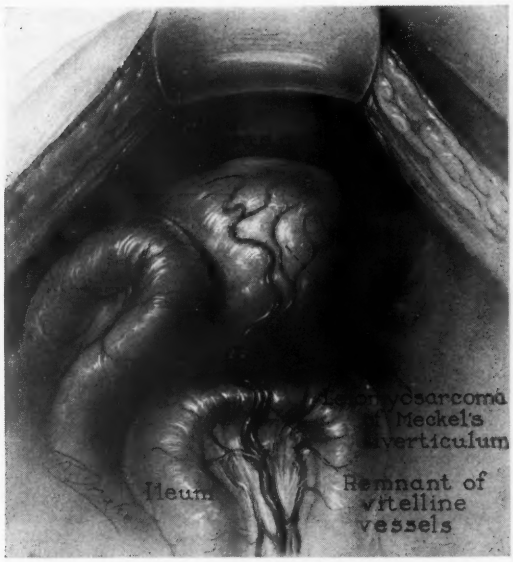


Fig. 3. Diagram to illustrate the origin and the course of enlarged, vitelline vessels.

This report is centered around two cases of leiomyosarcoma of Meckel's diverticulum, which is the commonest malignant tumor involving this congenital malformation. A diagnostic sign of importance is the persistence of the vitelline vessels leading to otherwise unrecognizable diverticula.

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ABOUT forty neoplasms arising in Meckel's diverticulum have been reported to date. These include leiomyosarcomas, adenocarcinomas, lymphosarcomas, carcinoids and leiomyomas. Of these, leiomyosarcoma, with ten reported cases, appears to be the commonest malignant lesion and we shall therefore limit our discussion to that entity.

Three cases of leiomyosarcoma of Meckel's diverticulum have been reported previously from the Mayo Clinic and we wish to report two additional cases, one of which we encountered ourselves.

Report of Cases

Case 1.—A 47-year-old farmer came to the clinic January 8, 1948, because of three recurrences of massive melena. Six years prior to his admission, he had had an episode of tarry stools for one week for which no treatment was given. Two years later he had had another episode of massive melena which required hospitalization and on one occasion he passed bright red blood from the rectum. A roentgenogram of the stomach

showed evidence of a duodenal ulcer. He was placed on an ulcer regimen which he followed for one year and then abandoned. One month prior to admission to the clinic the patient had a third episode of severe

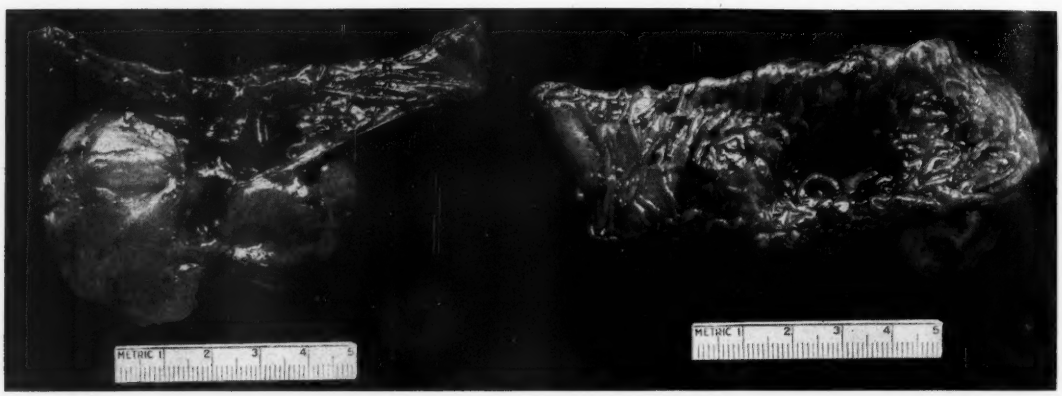


Fig. 1. Section of tumor attached to ileum. Notice the remnant of Meckel's diverticulum within tumor.

Fig. 2. Piece of ileum resected to show the opening of the neck of Meckel's diverticulum leading to the tumor as seen from the inside of the ileum.

melena and again passed bright red blood from the rectum on one occasion. Roentgenograms of the stomach again showed evidence of a duodenal ulcer and it was then that he was referred to the Mayo Clinic for consideration of gastric resection.

The results of physical examination were essentially negative except for some tenderness to the right and below the umbilicus. The duodenal ulcer was confirmed by a roentgenogram made at the clinic. Although the possibility of bleeding Meckel's diverticulum was entertained, a roentgeongram of the small bowel was not made. The hemoglobin determination showed 9.0 gm. per 100 cc. of blood and erythrocytes numbered 4,490,000 per cubic millimeter of blood. The results of other laboratory tests were noncontributory.

On January 20, 1948, exploration was carried out through a right upper midrectus incision. The duodenal cap did not show signs of an active or healed ulcer. A Meckel diverticulum (Figs. 1 and 2) was found, however, and it contained a bosselated tumor which was adherent to the peritoneal lining of the anterior abdominal wall midway between the anterior superior spine and the umbilicus. There was extensive parasitic blood supply from the anterior abdominal wall to the diverticulum. The results of examination of the rest of the small bowel were described as negative and there was no metastasis in the liver or peritoneum. It was assumed, therefore, that the tumor in the Meckel diverticulum was the cause of the bleeding. A short segment of the ileum containing the diverticulum together with the tumor and adherent peritoneum was removed. The intestinal continuity was restored with an end-to-end anastomosis.

The tumor was a grade 2 leiomyosarcoma which measured 7 by 4 cm. and was associated with a Meckel diverticulum. The mucosa of the distal end of the diverticulum was ulcerated, and a tract extended from this portion to a distance of 3.5 cm. in the body of the tumor (Fig. 1). The condition of the patient has been followed for five years since surgical intervention, during which time he has had no further melena; therefore, it is assumed that the melena was due to the ulcerating tumor.

Case 2.—A 61-year-old woman was seen at the clinic on January 27, 1958. Her chief complaint was increasing constipation for three years which forced her to take laxatives and to use enemas regularly. For three months prior to her admission the constipation became more noticeable and she began to feel pain at the tip of the tube when administering an enema to herself.

Her history was noncontributory except for total abdominal hysterectomy which she had undergone sixteen years before admission. At that time both ovaries and tubes were considered normal and were preserved. The small bowel, however, was not examined at the time of this procedure.

General physical examination did not show any abnormality. On palpation of the lower portion of the abdomen, however, a firm, moderately tender, slightly movable mass, approximately 10 cm. in diameter, was felt suprapubically and to the right of the midline. On bimanual examination the mass was found to be in the region of the right adnexa and anterior to the rectum.

Laboratory studies showed the sedimentation rate to be 50 mm. per hour; erythrocytes numbered 4,270,000 and leukocytes 9,500 per cubic millimeter of blood; the hemoglobin measured 11.6 gm. per 100 cc. of blood.

Because of the position and the tenderness of the mass, it was thought most likely to be a twisted, infarcted, or hemorrhagic ovarian cyst and exploration was deemed advisable.

On February 1, 1958, abdominal exploration was carried out through a secondary lower midline incision. A hemorrhagic infarcted mass was found in the pelvis, anterior and to the right of the rectosigmoid. Both

ovaries and tubes were easily identified and were normal in appearance, which excluded the possibility of a twisted or infarcted ovarian cyst. The mass was freed from its bed by blunt dissection and was found to be pendulous and hanging freely from the antimesenteric border of the ileum. A significantly large artery and its companion vein were seen overlying the bowel and extending from the mesenteric vessels to the tumor (Fig. 3*). After dividing these aberrant vessels the tumor was removed together with a cuff of antimesenteric wall of the bowel. The defect, which measured 3 by 5 cm., was closed transversely in the usual fashion. Metastasis to the liver or spread to the peritoneum was not apparent.

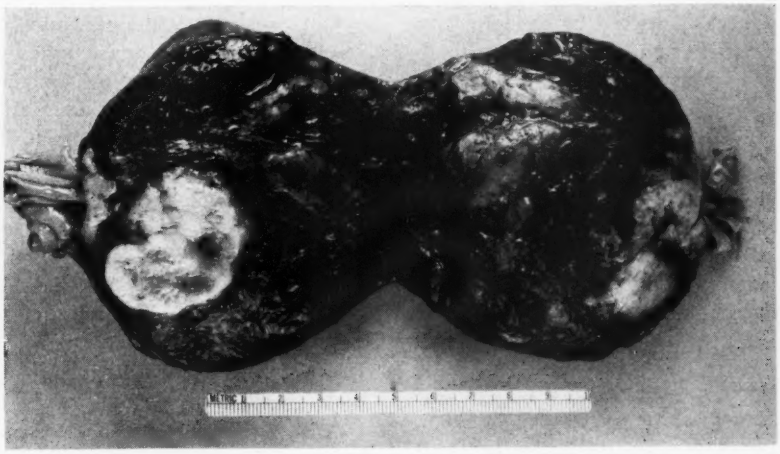


Fig. 4. Cross section of the tumor with attached piece of ileum showing its complete exenteric position and the advanced necrosis.

The tumor measured 9 by 7 by 7 cm. and grossly the greatest part proved to be infarcted (Fig. 4). Microscopic examination showed the tumor to be a grade 1 leiomyosarcoma; no remnants of Meckel's diverticulum were identifiable in the tumor (Fig. 5).

The patient's postoperative course was uneventful and non-morbid; she was dismissed from the hospital on the ninth postoperative day and returned home on the seventeenth postoperative day.

In spite of the fact that no identifiable remnants of a Meckel diverticulum were found within the tumor, it was assumed that the tumor originated in a Meckel diverticulum. Such an assumption was based on the completely exenteric position of the tumor in the terminal portion of the ileum, the pendulous nature of the tumor, the dimpling of intact mucosa at the base of the tumor, and the presence of the afore-mentioned aberrant vessels, the significance of which will be described later.

Comment

Interest was first aroused in leiomyosarcoma of Meckel's diverticulum by Nygaard and Walters[1] who reviewed the literature in 1937 and found reports of three cases of this condition. To these three cases they added two, one of which was their own. In 1939, Skinner and Walters[2] reported another case in which it was possible to demonstrate the diverticulum preoperatively on roentgenograms of the small bowel. The diverticulum, therefore, was thought to be the cause of the melena, but the patient was found to have a necrotic leiomyosarcoma arising in the diverticulum. We have reviewed the literature since that time and have found reports of only four additional cases: (1) the case reported by Moses[3] in 1947 of a patient who had had several intestinal hemorrhages necessitating blood tranfusions, but in whom the tumor finally necrosed and perforated and acute peritonitis developed; (2) the case reported by Thomas[4] of a 32-year-old Nigerian

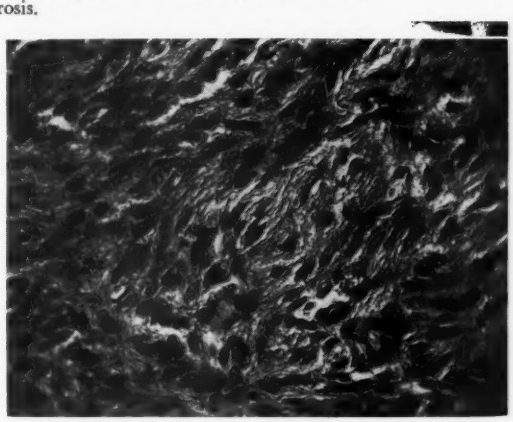


Fig. 5. Microscopic section of the tumor (hematoxylin and eosin; x350). Notice the leiomyomatous nature and its low histologic grade and prominent mitotic figures.

*See Page 1269.

man who had a tumor that measured about 10 cm. in diameter, the presenting feature being recurrent intestinal obstruction; (3) the case described by Barret[5] in 1954 of a 46-year-old man in whom a tumor produced an episode of acute intestinal obstruction; (4) the case described by Sanderup[6] in which skeletal metastasis had developed. The total number of cases of leiomyosarcomas of Meckel's diverticulum reported to date is therefore ten, aside from the two cases reported herein. The other two cases of malignant lesion in Meckel's diverticulum reported from the Mayo Clinic prior to 1937 included the case of a patient with fibrosarcoma reported by Faust and Walters[7] in 1931, and a case of adenocarcinoma arising in heterotopic gastric mucosa described by Kernohan and Gray and reported by Nygaard and Walters[1] in 1937.

In spite of the fact that leiomyosarcomas account for only a fourth of the total number of neoplasms of Meckel's diverticulum described in the literature, they still represent the most common tumor encountered in this location in cases reported in the last two decades. In the cases reported from the clinic, three of five such neoplasms were leiomyosarcomas.

Origin.—It must be made clear that leiomyosarcomas arise from the layers of smooth muscle in the diverticulum and not from the heterotopic gastric or pancreatic mucosa that is frequently encountered in Meckel's diverticulum. Furthermore, adenocarcinoma is more infrequent than sarcoma, there being only ten cases of adenocarcinoma of Meckel's diverticulum[8] reported to date.

Clinical Features.—Among the twelve patients having leiomyosarcoma of Meckel's diverticulum nine were men and three were women. Their ages varied from twenty-two to sixty-six years. The tumor was discovered in the youngest patient during an operation for hernia.

In the cases in which clinical data were available to us, the presenting symptoms were melena, intestinal obstruction, pain, perforation and peritonitis. Melena, which was massive in one of our cases, was also the presenting feature in two cases previously reported: in one patient it was severe enough to necessitate repeated blood transfusion[3] and in the other patient it was moderate and associated with secondary anemia.[2] Intestinal obstruction was the chief complaint in three cases: in one[5] it was acute and in two it was recurrent in nature.[1,4] It is interesting to note that in all cases with intestinal obstruction the tumor was located in the pelvis and obstruction was due to the extrinsic pressure of the tumor.

Pain was a presenting feature in one of our cases and in a previously reported case it was an additional feature,[4] but the amount of pain did not parallel the degree of necrosis of the tumor. Perforation of a necrotic tumor and peritonitis were the presenting features in one case.[3]

A comparison of these symptoms with those produced by leiomyosarcomas of the small bowel shows a striking difference. In seventy-six leiomyomatous tumors of the small bowel, Starr[9] found melena a symptom in fifty cases and abdominal pain a symptom in fifty cases, but intestinal obstruction was not so frequently encountered as when the tumor arose in a Meckel diverticulum.

A mass was felt on examination in one of our cases and in two other cases reported in the literature.[5,8] It is also interesting that all the palpable tumors were located in the pelvis.

A diverticulum was diagnosed by x-ray in one case.[2] Evidence of a diverticulum in association with a tumor on x-ray examination should be interpreted with caution since pseudodiverticula are sometimes seen with necrotic leiomyosarcomas.[9]

Pathologic Features.—The tumors varied in size from 8 to 15 cm. but they were uniformly large, and in all the cases in which a histologic diagnosis was available, the tumors were described as low-grade tumors (Broders' classification).

Neither metastasis to the liver nor direct spread to the peritoneal surfaces was present and these are the only methods of spread of leiomyosarcomas according to Starr.[9] However, in one case encountered by Friedl[10] in 1902, spread to the lymph nodes was reported. Such metastasis, as was shown by Starr,[9] probably represents metastasis to the peritoneal surface with subsequent growth of the metastatic lesion.

The diagnosis of the tumor as one arising in a Meckel diverticulum was based on the presence of a remnant of the diverticulum in seven cases and on the position of the tumor on the wall of the bowel and its location in four cases; in one the criteria are not available. The presence of a remnant of Meckel's diverticulum is the most conclusive evidence of the origin of the tumor. This should not be confused, however, with the epithe-

lized pseudo-diverticula seen in necrotic leiomyosarcomas.[9] An exenteric, antimesenteric tumor of the terminal 2 to 3 feet of the ileum or probably, although not necessarily, originates in Meckel's diverticulum. In a study of seventy-six cases, Starr[9] found fifty leiomyosarcomatous tumors of the small bowel to be completely exenteric and in some cases the mucosa was intact. In the absence of remnants of the diverticulum, as in advanced leiomyosarcomas of Meckel's diverticulum, we wish to emphasize the diagnostic value of enlarged remnants of the vitelline vessels (Fig. 3). These vessels, prominent in one of our patients, have been described previously in two cases reported from this clinic.[1,2] They consist of a sizable artery and its companion vein that arise from the mesentery of the ileum and cross the bowel to supply the tumor. Under normal circumstances they are of smaller size than other vessels but they can be identified easily in the mesentery of a Meckel diverticulum. With the advent of malignant change they may assume extremely large proportions to maintain a blood supply equal to the growth of the tumor. We wish to stress their diagnostic value in the absence of all other criteria.

Treatment

The treatment of choice, as in leiomyosarcomas of the small bowel, should generally be excision of the segment of bowel containing the tumor and end-to-end anastomosis.[9] From the surgical standpoint there are two important factors. First, the benign tumors are small. The large tumors, 7 cm. or more in diameter, were uniformly malignant according to Starr,[9] and even when the microscopic picture of malignancy is not clear, the tumors undoubtedly will act like true malignant neoplasms by metastasizing and causing the death of the patient. Therefore, since these leiomyosarcomas are usually radioresistant, every effort should be made to extirpate them surgically. At the same time any identifiable metastatic lesions that are accessible should be removed also.

Second, leiomyosarcomas of the small bowel and also those of Meckel's diverticulum spread by peritoneal seeding or spread via the blood to the liver. They rarely, if ever, spread via the lymphatics. If complete removal of the tumor can be accomplished by removing a segment of ileum or a large portion of the wall of the bowel, it is not necessary to take a deep wedge of the mesentery of the small bowel and run the risk of possible interference with the blood supply to the remaining portion of the intestine.

Prognosis

In leiomyosarcomas of the small bowel, Starr[9] found higher survival rates in cases in which a segment of the bowel was resected with the tumor. He also reported the survival rate to be more than 50 per cent in cases of grade 1 lesions but it was poor in cases of high-grade sarcomas. These figures should be applicable to lesions of Meckel's diverticulum also, although data on all of these twelve cases are not available. One of our patients survived five years only to die subsequently of a heart attack.

Summary

Two cases of leiomyosarcoma of Meckel's diverticulum encountered at the Mayo Clinic have been added to the ten cases already reported in the literature. The pathologic, clinical and anatomic features of this intriguing entity were analyzed.

The persistent vitelline vessels are of great diagnostic importance when an identifiable remnant of the Meckel diverticulum is not present. Removal of local growth and accessible metastatic lesions is extremely important. Lymphatic spread is rare and therefore resection of a deep wedge of the mesentery of the small bowel is unnecessary.

References

1. Nygaard, K. K. and Walters, W.: Malignant tumors of Meckel's diverticulum: Report of case of leiomyosarcoma. Arch. Surg., 35:1159-1172 (Dec.) 1937.
2. Skinner, I. C. and Walters, W.: Leiomyosarcoma of Meckel's diverticulum, with roentgenologic demonstration of the diverticulum: Report of a case. Proc. Staff Meet. Mayo Clin., 14:102-107 (Feb. 15) 1939.
3. Moses, W. R.: Meckel's diverticulum: Report of two unusual cases. New England J. Med., 237:118-122 (July 24) 1947.
4. Thomas, H. O.: Myosarcoma of Meckel's diverticulum. Surgery, 32:667-672 (Oct.) 1952.
5. Barret, J. C.: Malignant tumours of Meckel's diverticulum. Brit. J. Surg., 4:518-519 (Mar.) 1954.
6. Sanderup, A. K.: Primaert karsinom i Meckels divertikel. Nord. med., 54:1209-1211, 1955.
7. Faust and Walters: Quoted by Nygaard, K. K. and Walters, W.[1]
8. Moore, R. M. and Parsons, W. H.: Carcinoma of Meckel's diverticulum: Report of case with summary review of the literature. A.M.A. Arch. Surg., 67:939-942 (Dec.) 1953.
9. Starr, G. F.: Myomatous tumors of the small intestine: Benign and malignant. Thesis, Graduate School, University of Minnesota, 1953.
10. Friedl: Quoted by Nygaard, K. K. and Walters, W.[1]

Hemolytic Anemia with Cold Hemagglutination and Atypical Pneumonia

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COLD hemagglutination usually refers to the clumping of red cells in a mixture of a serum or plasma at refrigerator temperature. If the cold hemagglutinin titre is high enough, however, the clumping may be observed even at room temperature. The agglutination is completely and rapidly reversible at body temperature or 37° C. Cold hemagglutinins have been described in a variety of unrelated conditions such as cirrhosis of the liver, pregnancy, leukemias, yaws, atypical pneumonia and rarely in apparently normal individuals. The most common association seems to be that of cold hemagglutinins in atypical pneumonia. This association was described by Peterson, Hamm and Finland[1] in 1943.

Although cold hemagglutinins are rather commonly found in cases of atypical pneumonia, the association of a hemolytic anemia with cold hemagglutination, to any marked degree at least, is rather unusual. The hemolytic anemia in these cases is acute but recovery can be expected approximately paralleling recovery from the pneumonia.

Report of Case

This case is that of a 29-year-old woman who was admitted to St. Mary's Hospital under Dr. W. L. Herbert on February 5, 1958. About three weeks before admission, she had a chest cold with a persistent cough productive of small amounts of sputum. Ten days before admission, she consulted Dr. W. L. Herbert who took a chest x-ray and made a diagnosis of pneumonia. Hospitalization was advised but refused by the patient. She was then treated with Achromycin and advised to remain in bed at home. She did not comply with this advice but continued to do her daily housework. She became afebrile but coughing of yellowish sputum persisted and she became very weak. When she again consulted Dr. Herbert she was extremely pale and this time, he insisted upon hospitalization.

Family history, past history and system review were essentially noncontributory. Physical examination revealed a well developed, very pale white woman. Blood pressure was 120/60 and pulse 120. There was a slight icteric tinge to the sclerae. There was no significant lymphadenopathy. There were a large number of inspiratory coarse moist rales in the left lung base and classical signs of consolidation including bronchial breathing and dullness over the right lower lobe. The heart was normal in size. There was a grade I short apical systolic murmur. Spleen and liver were not palpable. The remainder of the examination was normal.

Laboratory.—Routine urinalysis revealed a specific gravity of 1.026, negative albumin and sugar and negative microscopic. Hemoglobin was 6.3 grams. White count was 14,100 with 77 per cent neutrophiles, 19 per cent lymphocytes, 3 per cent monocytes and 1 per cent eosinophiles. On blood smear the red cells showed a marked increase in polychromasia with occasional normoblasts. There was marked clumping of the red cells. Platelets were normal and leukocytes were normal. Her total serum protein was 7.2 grams per cent with 4.7 grams albumin and 2.5 grams globulin. Reticulocytes were very numerous but accurate counting could not be done because of the clumping of the red cells. The cold agglutinin titre was greater than 1:8, 192, and macro cold agglutinins were easily demonstrable. X-ray of the chest revealed an extensive mottled confluent pneumonitis involving the lower third of the right lung.

Course in the hospital.—The patient was treated with Prednisolone 15 mgm. and Achromycin V 500 mgm. every six hours. Room temperature was raised to between 80° and 88° and kept at this temperature. On this regimen, gradual improvement was noted until by February 22 the hemoglobin was 11.2 grams with a hematocrit of 35 per cent. Cold agglutinins had reduced by this time to 1:512 and the pneumonia had cleared. Prednisolone was tapered off until by the time of discharge she was receiving none.

Comment

This case seems to be typical of others that have been reported in the literature.[2] This patient, however, did not have Raynaud's phenomenon or any other obliterative vascular phenomena which have been commonly observed in other cases. These phenomena are apparently due to intravascular clumping of the red cells with plugging of the capillaries and smaller arterioles.[3,4] At times this may actually lead to gangrene of the extremities.[5] Splenomegally was absent in this case as seems to be the rule in previously recorded cases associated with atypical pneumonia.

The mechanism of the hemolytic process has not been clearly defined. The level of hemagglutinin titre does not seem to be the only factor in the development of hemolysis.[6] It has been demonstrated that cold agglutinated red cells are mechanically fragile.[7] Erythrophagocytosis of the damaged cells may account for some hemolysis. This is probably not the only explanation for the red cell destruction that occurs. Various hemolysins have also been demonstrated in these patients.[2]

The management of these cases includes keeping the patient warm, treating the pneumonia and giving steroid therapy. The necessity of keeping the patient warm cannot be over emphasized. The *in vivo* hemolysis induced by chilling a patient's arm has been demonstrated experimentally.[8] Gangrene developing in an arm close to a cold outside wall in the hospital has been seen.[9] Room temperature should be kept between 80° and 85°. The patient should be instructed to keep the extremities under the covers. Cold oxygen tents should not be used. Sponging of the patient and exposure during baths should be avoided and even cold drinks should be forbidden.

Transfusion at times may be necessary but should be performed with great caution. First of all, it is very difficult to cross-match these patients due to the cold hemagglutination interfering with the usual method of cross-matching. Cross-matching must be done with warm slides to be at all successful. Furthermore, the administration of cold bank-blood may be disastrous. If a transfusion is done, the blood should be warmed to body temperature before it is administered and should be kept warm during administration.

Treatment of the pneumonia is accomplished according to the usual means. The administration of steroids is perhaps a little empirical but they seem to have been of some benefit in previously reported cases[2]. Their true relative value, however, is a little difficult to assess.

References

1. Peterson, O. L., Hamm, T. H. and Finland, M.: Cold agglutinins in primary atypical pneumonia. Science, 97:167, 1943.
2. Pisciotta, A. V.: Cold hemagglutination in acute and chronic hemolytic syndromes. Blood, 10:295, 1955.
3. McCombs, R. P. and McElroy, J. S.: Reversible auto-hemagglutination with peripheral vascular symptoms. Arch. Int. Med., 59:107, 1937.
4. Benian's, T. C. and Feasby, B. R.: Raynaud's phenomenon with spontaneous cold hemagglutination. Lancet, 2:479, 1941.
5. Stats, B. and Bellowa, J. G. M.: Cold hemagglutination with symmetric gangrene of the tips of the extremities. Arch. Int. Med., 72:506, 1943.
6. Stats, B. and Wasserman, L. R.: Hemagglutination —an interpretive review. Medicine, 22:363, 1943.
7. Stats, B.: Cold agglutinated erythrocytes: The hemolytic effect of shaking. Proc. Soc. Exper. Biol. & Med., 54:305, 1943.
8. Coleman, R. A. and Snavely, J. G.: Acute hemolytic anemia in primary atypical pneumonia by exposure and chilling. New England J. Med., 237: 505, 1947.
9. Hagen, Paul S.: Personal communication.

The Physician and the Minnesota Teen-age Code

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THE physician is in a unique position to assume leadership and lend support to the community efforts promoting child health and welfare. His close and early contact with both parent and child often allows him to be aware of contributing factors leading to possible deviant behavior in the child, and youth, before he comes in conflict with the laws of his society.

Desiring to emphasize the important potential of preventive action in the area of delinquency of youth, the Minnesota State Chapter of the American Academy of Pediatrics has been interested for some time in a challenging program existing in our state in the form of a teen-age social code.

We are fortunate in Minnesota in having effective existing organizations which have been working on the juvenile problem for some time and with results. Among these groups, the Governors Advisory Council on Children and Youth has formulated the "Minnesota Teen-Age Code." This code has achieved enthusiastic support in our state and attracted national attention. Correspondence regarding the code and requests for copies have been received from nearly every state. Actually, several states are initiating similar programs after observing the strong support our Minnesota Code program has received from parents and youth.

The Minnesota Pediatric members felt this excellent program should be emphasized to all physicians of our state as deserving of their interest, and, should they be called upon to aid it, their cooperation. Accordingly the program of the "Minnesota Teen-Age Code" was presented to the Council of the Minnesota State Medical Association and unanimously approved at the October, 1958 meeting. The hope is that this action will enlarge physician interest and participation in the program at the local community level.

What is the "Minnesota Teen-Age Code"?[1]

The Minnesota Teen-Age Code is a set of guiding principles developed to help achieve cooperation among parents and students for a safe and acceptable program of social activities for young people. It is based on parent and student surveys here and elsewhere and is issued by the Governor's Youth Council and the Governor's Advisory Council on Children and Youth.

How was a Code Developed?

The original draft was prepared by youth themselves at the Governor's Conference held in May, 1956. It was then forwarded to youth throughout the entire state who were given the opportunity to discuss it and revise the original. This second draft was then studied by the Governor's Advisory Council and a final draft prepared. It is estimated that over 600 youth and 300 adults have participated in the preparation of the Code.

Why a Code?

As young people mature, they desire more freedom. They usually welcome direction but they resent arbitrary orders. Because of group pressures young people are often placed in difficult situations. They want and need the understanding support of their parents and they frequently admit to a need for some guide of behavior.

Many parents feel a need for support in combating the argument from their teen-agers that "Everybody does it." Also, teen-agers need protection from adults who impose unreasonable standards. By setting up desirable and acceptable standards of behavior in these age groups, parents and young people can help to avoid later problems.

What are the Contents of the Code?

The Code is intended to be a basis for determining acceptable conduct regarding: (1) parties; (2) use of the car; (3) suitable hours; (4) appropriate dress; (5) the problems of party crashing; (6) proper respect for rights and property of

others; (7) smoking by teen-agers; (8) drinking of alcohol.

How May the Code be Started?

The code to be understood, well received and respected must be the local product of parents, teachers, and youth. Then it most successfully reflects the needs, standards and attitudes of the particular school or community involved. Parent-Teacher Associations serve as ideal sponsoring organizations since they can conviently reach parents, teachers, and youth. To accompany the code, realistic curfew regulations are necessary and these are the result of the joint action by citizens, and local enforcement agencies.

Does the Code Work?

This is still impossible to answer in a final way. Recently the principal of a local school reported: "Parents don't demand 100 per cent obedience to the code at all times, nor do students live up to it 100 per cent. Nevertheless, the over-all effect has been good."

It is a long term project but by the spontaneous enthusiasm it has generated in youth, parents and authorities, it appears to be going in the right direction. And it is uniting the effort of the community forces like nothing else tried to date in our state! Our state is busy laying the groundwork to make an all-out effort to put the code into all of our 1300 communities. It is now in operation in 113 cities including our two largest cities. There are at present some 271 schools in Minnesota that have taken some action in reference to the code.

Why Should the Physician be Interested?

Along with other citizens the physician participates and lends leadership to programs for community improvement. It is a natural role for the physician to be associated with a program that attempts to develop in a community a guide for the range of normal behavior in children and youth.

One of the physician's assets most needed and constantly used by parents is his knowledge of the normal range of behavior and activity, whether it is about feeding, bowing of the legs, or the variations of acceptable conduct of teen-agers. In this area he is on very familiar ground. The physician's support of a community group, whether it be school, church, PTA, or community council in the establishment of a Teen-Age code, will lend prestige, professional standing and impetus to the program.

A booklet* entitled "Minnesota Teen-Age Code" contains a suggested code for the Junior High School level (Grades 7, 8, 9), and the Senior High School level (Grades 10, 11, 12). Included is a model curfew ordinance.

Printed below is that protion of the Minnesota Teen-Age Code relating to the Senior High School.[1]

References

1. Youth Conservation Commission: Minnesota Teen-Age Code. Saint Paul, Minnesota.

MINNESOTA TEEN-AGE CODE

Senior High School

Grades 10, 11, and 12

Basic Rule

Parents should know where their sons and daughters are while away from home, what they are doing, and with whom they are spending their time. Parents should also know what time their young people return home.

Parent-Youth Planning

(A) An allowance should be planned together, based on a discussion of financial ability, needs, and the management of money.

(B) Family plans should be organized so that: (1) necessary transportation for all members of the family can be provided; and, (2) individual members can be reached in case of emergency or change of plans.

Home Entertaining

The home should be the center of young people's social activity. To accomplish this, the co-operation and support of parents is needed. Young people should be encouraged to bring friends into the home and to accept the invitations to visit the homes of friends. Parents should welcome the opportunity to meet their sons' or daughters' companions and friends.

(A) It is important that invitations be clear as to type of function (for appropriate dress), the time of beginning, and ending of a party. It is the responsibility of the guests to leave at the designated time.

(B) It is important that a parent or responsible adult be at home and on call at all times when young people entertain but should provide an agreeable measure of privacy.

(C) Young people and their parents feel more comfortable if some plans for entertainment have been made in advance. Boredom and confusion lead to undesirable

*Copies of the "Minnesota Teen-Age Code" and the "Minnesota Teen-Age Code Handbook" may be secured by writing to: Governor's Advisory Council on Children and Youth, 129 State Office Building, Saint Paul 1, Minnesota.

results. Well laid plans for a party are disregarded only by a rude guest. A considerate guest will follow the plans of the host.

(D) Party crashing is an inexcusable custom and presents a problem for the host and other guests. Crashers should not be admitted.

(E) "Lights out" has no place in a well-ordered party.

General Dating

(A) The home should be offered and encouraged as a possible place for dating. Parents should co-operate by providing an agreeable measure of privacy. Public entertainment puts a strain on teen-agers' allowances.

(B) Dressing according to the occasion makes a person feel more comfortable.

(C) Young people and their parents should agree in advance on a definite time for return from a date. A boy should be given an opportunity to meet the parents of the girl and to discuss expected time of arrival at home.

Hours

In deciding on a satisfactory hour for a young person's expected arrival at home from a social engagement, two factors have to be considered: *(1) What time will the affair be over? (2) What is a reasonable amount of time to allow for arrival home following the affair?*

1. *What time will the affair be over?* The following is a suggested guide for:

(a) Non-school nights:

	GRADES		
	10th	11th	12th
Formals	11:00	12:00	12:00
	12:00	1:00	1:00
Informals	11:00	11:00	11:00
	11:30	12:00	12:00
Home parties	11:30	12:00	12:00
General dating	11:30	12:00	12:00

(b) School nights:

10:00 except for special events, such as school, church or other recognized activities.

2. *What is a reasonable amount of time to allow for arrival at home?* (If transportation is provided by parents, this is no problem.)

(a) An invitation issued for refreshments following a dance or other late social function should include a definite time for beginning and ending. One hour would seem adequate for an occasion of this type but is subject to regional conditions.

(b) Young people should come directly home from a function unless other plans have been approved by parents. *If a young person is delayed for any reason, he should telephone home.*

(c) Parents should know when young people arrive home.

Driving

(A) Parental consent for the driving privilege should be based on: (1) Possession of a driver's license; (2) young people's proof of ability to control themselves and the car; (3) a healthy attitude regarding the rights and welfare of others.

(B) Because it affects the lives and property of others, teen-agers should be allowed to drive a motor vehicle *only* with a license (or permit) issued by the Drivers' License Division of the State of Minnesota. A licensed driver must accompany the teen-agers driving with a permit. State law prohibits anyone from allowing another to drive a motor vehicle without a driver's license.

(C) *Trained instruction is urged.* Careful driving, as well as good driving attitudes, can save lives and secure the economic welfare of an entire family.

(D) It is the duty of parents and youth to make certain that any car driven by young people is in safe operating condition.

(E) Young drivers should be expected to assume their portion of responsibility for the maintenance and appearance of the shared car.

(F) Parents should be firm in their decision to take away the car privilege when it is abused. On the other hand, they should be generous in their praise of proper driving attitudes and careful handling of the car.

(G) Young people should understand that overcrowding of a car is dangerous.

(H) Riders have a share in the responsibility for safe driving. Dares and jeers from riders have been responsible for more than one death.

(I) Young people should understand that it is wise to refuse to ride with a reckless driver. Call your parents, or call a cab.

Drinking

Drinking among high school students presents a serious problem in which parents and youth must consider their responsibilities. Young people confirm that a number of parents serve alcoholic beverages (beer, wine and whiskey) to young guests in their homes. It is well known that alcoholic beverages are brought to parties by guests, and are served by the guests themselves.

(A) No one has the moral or legal right to serve any alcoholic beverages to other people's children. The adult who does so may be charged criminally and is directly responsible for any of the serious consequences which may result.

(B) Minnesota State Law prohibits sale of liquor or 3.2 beer to minors (under 21 years of age) and forbids serving it to them and consumption by them.

(C) Parents should impound any alcoholic beverage which is brought to a party and notify the parents of the offender. No alcoholic beverages should be accessible to young guests.

(D) Young people should understand that it is not a disgrace to decline an alcoholic drink.

(E) Young people should understand that it is foolhardy to ride with a driver who is under the influence of alcohol, and should instead seek safer means of transportation.

Smoking

(A) Minnesota State Law prohibits sale of cigarettes and tobacco to persons under 18 years of age and prohibits such persons from smoking except in their home with their parents' consent.

Editorials

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HORMONE WITHDRAWAL BLEEDING AS A PREGNANCY TEST

The physician frequently desires to diagnose the presence or absence of a gestation in a patient whose menses are only a few days overdue. The conventional biologic pregnancy tests usually are not sufficiently sensitive to detect a gestation of less than one month's duration since they depend upon chorionic gonadotropic hormone, which does not rise to a sufficiently high level before that time. The principle of hormone withdrawal bleeding can be used as a pregnancy test and is especially useful in the diagnosis of early pregnancy. Three methods will be discussed briefly.

One series of patients received a daily injection for three days of a combination of 2.5 mgm. of estradiol benzoate and 12.5 mgm. progesterone, commercially known as Prometron (Schering). The non-pregnant patients had menses between two and fifteen days after the last injection. Most of this group menstruated after four or five days. None of the pregnant patients bled except for one who spotted slightly.

A second series of patients received 100 mgm. progesterone in one dose intramuscularly. The non-pregnant patients menstruated between two and fourteen days after the last injection, with most requiring five to six days. The pregnant patients did not bleed.

A third series received orally four tablets daily for three days, each tablet containing 50 mgm. of anhydrohydroxyprogesterone and .03 mgm. ethinyl estradiol, commercially known as Pro-Duosterone (Roussell). The non-pregnant patients menstruated from two to fourteen days later. Most started bleeding two to four days after concluding the pills.

If progesterone with or without estrogen is administered to a patient whose menses are a few days overdue, the pregnant patients should not bleed, but the non-pregnant patients should have a menses due to hormone withdrawal bleeding. In the great majority of all of the above tests the flow induced by the hormone withdrawal was similar to normal menses. Occasionally, the patient stated that the flow was slightly scanty or slightly prolonged.

Hormone withdrawal bleeding approaches 100 per cent accuracy as a pregnancy test provided it is used in women whose menses are not over a couple of weeks overdue and whose previous menses have been fairly regular. When the test was applied to women who had not menstruated for more than three months, most of the non-pregnant women menstruated, but the number of non-pregnant women who did not menstruate was increased. It is in early pregnancy where the test is most needed and most accurate. The interval between medication and flow apparently depends upon many factors including when given in relationship to ovulation and the previous priming of the endometrium by estrogen. Hypothyroidism and adrenogenital syndrome could influence the picture.

Recently, it has been found that pseudohermaphroditism may be present in female infants born of mothers who received progesterone, especially the androgenic steroids, during pregnancy. None of the infants born after the described hormone tests had pseudohermaphroditism.

It may be concluded that the principle of hormone withdrawal bleeding may be used as a safe and accurate pregnancy test.

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POLYBECHIA

Two contrasting aspects of the problem of coughing are thought-provoking: (1) its ubiquitous high prevalence; (2) the neglect of its treatment. Cough is common in children, adults and in the aged. It is noted perennially, with peak of frequency in winter. Why is it neglected? Possibly, because the individual and persons about him become habituated to it. Secondly, because its potential hazards are not appreciated. Thirdly, because of easy accessibility of over-the-counter cough remedies, none of which cures the disease that is causing the cough. Our responsibility in correcting this anomalous situation lies in effective prevention and etiologic treatment. Preventive measures cover a vast field of endeavor from atmospheric sanitation to personal prophylaxis. Accomplishments in both of these directions are far

behind the ideal. Adequate treatment has two prerequisites. First, the public should be made aware of the importance of this issue so that remedial intervention could be done early. Secondly, the medical profession should offer better diagnostic and more effective therapeutic means.

Harmful effect of cough may be immediate or cumulative. Immediate damage is possible in the form of pulmonary hemorrhage, hematemesis, spontaneous pneumothorax, interstitial emphysema, pneumomediastinum, tussive syncope, strain on the right ventricle, pain in the chest, dyspnea, exhaustion, vomiting, loss of appetite, headache, insomnia, fracture of ribs, interference with healing of pulmonary disease, spread of infection within the lung, bronchospasm, asthmatic attack. Cumulative damage may be found in the form of pseudohypertrophic emphysema (hypertrophic, obstructive emphysema), heart strain and hernia, including hiatus hernia.

In reference to cough as a diagnostic clue, it is expedient to focus inquiry on certain categories and suggestive leads. Cough is observed in febrile affections such as common cold, bronchitis, lung abscess and in specific diseases such as whooping cough, fungus infections, tuberculosis, pneumonia of viral or bacterial origin. Lung involvement occurs in 20 to 60 per cent of tularemia and in 30 per cent with brucellosis; in rheumatic fever, incidence of specific pneumonia varies from 1 to 10 per cent. Cough may be noted during the course of exanthematous communicable diseases of childhood. As a matter of fact, lesions of measles in the bronchi and bronchioles are well established by the time skin rash appears. Other diseases with fever and cough include diphtheria, amebiasis, melioidosis and some instances of toxoplasmosis, syphilis, anthrax, glanders and some of the parasitic infestations. Patients with longstanding cough should be scrutinized for chronic diseases of the upper respiratory tract, chronic bronchitis, pneumonitis, lung abscess, tuberculosis, fungus infection, bronchiectasis, bronchial asthma, pulmonary fibrosis and sarcoidosis, emphysema, heart disease with mitral stenosis or left ventricular failure, cystic disease of the lung, benign and malignant tumors of the lung, mediastinum and other thoracic structures and organs and pulmonary alveolar proteinosis. Sudden, spasmodic cough, without fever or with slight elevation of temperature may result from aspiration of foreign body or food, from asthmatic bronchitis, bronchial asthma, rupture of an abscess or cyst into a bronchus, pulmonary infarction, pulmonary edema, pulmonary hemorrhage, bronchitis due to inhalation of noxious fumes and gases, migrating broncholiths, laryngeal edema, bronchopleural perforation of empyema.

Concerning cough in infants and children, reference has been made to infections of the upper and lower air passages and to bronchial asthma. It is well to keep in mind the possibility of mucoviscidosis (fibrocystic disease of the pancreas) an increasingly large number of which are diagnosed in daily practice. Aspiration of foreign bodies provokes much coughing and gagging. Even so, in some instances the episode is forgotten until symptoms of lung abscess bring the patient to the physician. Debilitated infants and those with anomalies causing faulty deglutition may be found to have lipoid pneumonia. Foreign body in the esophagus may incite cough. Esophagotracheal, esophagobronchial fistulas, esophageal atresia are associated with cough. Other possible causes of cough are tumors of the larynx and trachea, congenital absence of tracheal cartilages, compression of the trachea by the thymus, enlarged lymph nodes, enlargement of the heart, anomalous blood vessels, mediastinal tumors or bronchial cysts. Insidious cough with severe anemia may signalize hemosiderosis. Hand-Schueller-Christian disease shows its highest incidence during the first decade of life. Cough may make its appearance at birth in some cases of intralobar sequestration.

Of the population of the United States, 10 per cent are over the age of sixty-five. This group has an increased susceptibility relative to cardiopulmonary diseases. Therefore close attention should be paid to the origin of cough, with reference to the high incidence of chronic bronchitis and pneumonitis, fibrosis, bronchial asthma, pseudohypertrophic emphysema, bronchiectasis, bronchogenic carcinoma, arteriosclerosis and heart failure.

When past history and family history are suggestive of an allergic background, one should remember that cough may precede bronchial asthma by years. In some of these individuals with allergy cough may be attributable to allergic bronchitis, cold allergy, Loeffler's syndrome or lung lesions associated with erythema nodosum.

Cough occurring when the person changes position from erect to horizontal, stoops down or bends over may signify spilling of exudate or for-

eign material from smaller into larger bronchi. Diagnostic studies should be directed toward bronchiectasis, infected lung cyst, lung abscess, bronchopleural fistula, cardiospasm and diverticulum of the esophagus.

Cough that is more pronounced at night should bring to mind the following possible provocative causes: heart failure, tumors of the lung and mediastinum, enlarged mediastinal lymph nodes, allergic bronchitis.

It can be seen that cough is an important signal calling for accurate diagnosis as well as for proper treatment of the symptom and its causative disease.

ANDREW L. BANYAI, M.D.

MEDICINE'S GREATEST PROBLEM

John Bunyan, in "Pilgrim's Progress," described the man with the muck rake who was so engrossed with the muck about his feet that he did not have time to lift his eyes to see the vast and ever-changing beauties of the skies.

Considering medicine as not only the body of people who practice this profession, but accepting the theme of medicine as a broader concept of the philosophy and practice of the art and science of medical care, many facets of its problems at once present themselves. It is relatively easy to simplify the question according to one's major interests and to the locality in which one works. The problem of communicable diseases including tuberculosis throughout the world is huge. The nutritional aspects of cardiovascular disease, the apparent increase in neoplastic disease, the physiological and social aspects of aging, the growing awareness of the psychological factors in disease, are only some of the questions which might be regarded as great medical problems. Consideration of such subjects as these is interesting and could lead to weighty discussions of statistics, of global incidences, of scientific attitudes, and of therapeutic successes and failures. But would not such a discussion be comparable to the attitude of the man with the muck rake, concentrating on one facet only of the entire field of medicine?

Medicine implies consideration of those who are engaged in its practice and the training of medical students must be included in the discussion of our leading question. During the past five decades, vast strides have been made in the knowledge of the human body both in health and in disease. The scientific basis of medicine has become more complex with increasing knowledge of physiological and pathological processes. The advent of cytochemistry, of new methods of study with radio-isotopes, of new methods of culture of cells, bacteria and viruses, and many other technical developments have extended the fields of study necessary as a background to the clinical understanding of disease. In the clinical field, diagnostic advances have led to a demand for highly trained technicians and expensive equipment to carry out analyses and studies of various fractions of or excretions from patients, and the well-trained clinician is expected to be able to interpret the significance of minor variations from a normal pattern. In the realm of therapeutics, new and effective drugs are being developed at a phenomenal rate, and their name and effect is legion. As these new advances must be imparted to students, the medical educator is faced with the problem of training medical students in such a manner and within a reasonable space of time to the degree that they have all the basic knowledge necessary to utilize these advances in the best interests of those who eventually are entrusted to their care. All medical educators are conscious of the demands being made on the time and mental capacity of students and the problem of the best means of utilizing the relatively short time for formal training in such a vast and varied field. The maintenance of a balance between time and content in medical training is one problem which yet remains to be solved.

For the trained and practicing members of the medical profession, some degree of specialization has become a *sine qua non*. This development appears to have become inevitable, as the total sum of knowledge has become so great that it is no longer possible for one man to have complete knowledge of even one subject in medicine, let alone the entire field. Consequent on the increasing need for laboratory and technical services in diagnosis and in treatment, it is difficult for the medical man to maintain direct and personal contact with his patient except for brief periods. The close personal relationships which formerly existed and are tritely called the "doctor-patient relationship" are in danger of becoming a tenuous myth. Carried to its absurdity, the present trend in specialization could lead to the appearance of the "branch bundle block" specialist who might never see a patient but would conduct a remunerative practice in diagnosis and treatment from his expensively appointed office on the basis of electro-

cardiograms taken by a technician. There is an acute danger of complete loss of perspective on the part of the profession as the result of increasing specialization and this problem requires careful thought and some action if Medicine is to avoid fragmentation.

Members of the profession who are most concerned with disease control on a broad community basis are acutely aware of the many problems of a medico-social character which are arising. In many countries in the world, the control of communicable diseases and improvements in maternal and child care, with the subsequent fall in neonatal and adult death rates, has led to a rapid and perhaps alarming population increase in these countries. It is natural that the question is repeatedly asked as to whether these results of improved medical care are beneficient to the community as a whole. Where the total available resources of a country in food, housing, and material comforts are limited, is this increase in population, which is a direct result of medicine, going to lead to overwhelming medical and social-economic problems in the future? It may be that want, poverty, aging and mental ill-health will increase in the future. This major question faces the medical and Governmental administrators and future community planning must take cognizance of this fact. The closest study of this question involves not only the economists, sociologists and agronomists, but also the medical profession. Medicine must realize the social and economic impacts of medical science and accept its share of the responsibilities which are entailed.

I have referred to only a few of the many great problems which are requiring solution. If we accept the concept that the aim of medicine is to promote the well being, happiness and contentment of mankind rather than the negative view that medicine is concerned only with the treatment of overt disease, then it is necessary that the practitioners of medicine reappraise their attitudes and recognize and face the many problems which are now being presented. To me, therefore, medicine's greatest problem is one of re-orientation to the vast complexities which have arisen from progress in the scientific fields, and the changes which have taken place in the relationships between medicine and the people. Medicine must cease its absorption in minutiae of detail and further examine its relationships with humanity. The danger of an increasing isolation from the community as medicine retreats within its laboratories and its gadgetry must be realized. The impacts of advances in medical science have had community-wide effects and medicine must play its part in solving the resulting problems which the community faces.

Might I therefore propose that medicine's greatest problem is to recover and to develop its sense of proportion in the light of increasing scientific knowledge and extreme specialization, and in so doing to provide benevolent leadership in the field of human relationships and understanding. Medicine may in this manner really contribute to the health of mankind.

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ANTIHYPERTENSIVE AGENTS
III. Their Disadvantages

To the physician who has had experience in the use of hypotensive drugs, the disadvantages of present medical therapy are obvious.

Expense.—The medical treatment of hypertension is expensive. When large doses of medicaments are required, it is not unusual that the cost of drugs alone may be in excess of a dollar per day. This does not include professional fees for constant supervision of their administration. It is no wonder that our neurosurgical colleagues remind us that extensive thoracolumbar sympathectomy is less expensive than medical therapy.

Tedium.—The medical treatment of hypertension can be tedious and time-consuming for both patient and physician. Success frequently requires perseverance and intelligent cooperation on the part of the patient, together with patience, sympathetic understanding and meticulous attention to detail on the part of the physician. Only if the physician himself is convinced of the value, importance and efficacy of medical treatment will he be able to engender the necessary enthusiasm for such therapy in his patients.

Side Effects.—The greatest disadvantage of present hypotensive therapy is the high incidence of unpleasant, annoying and sometimes dangerous side effects that it induces. Fortunate and rare is the hypertensive patient whose blood pressure can be adequately controlled with drugs without the production of pharmacologic side effects. Too

often, unfortunately, an otherwise successful therapeutic regimen must be abandoned or modified to the detriment of its effectiveness because of intolerable or dangerous side effects. Skillful manipulation of drugs, coupled with kindly persuasion, will reduce the incidence of such failures but will not eliminate them.

Drug Failure.—With the hypotensive drugs presently available, it is frequently impossible to obtain a smooth and even decrease in blood pressure. One usually must settle for reduction of the average blood pressure and recognize that occasional hypertensive intervals are to be expected. Such erratic control of blood pressure has not been incompatible with good therapeutic results. In only exceptional cases is hypertension totally resistant to drug therapy. When failure occurs, it usually results from the patient's inability to tolerate effective doses because of side effects.

Patient Failure.—Successful medical treatment of hypertension depends ultimately on the patient's taking medicine regularly and in adequate doses. In this regard, patients tend to grow careless about regular visits to the physician, to omit or alter doses or to stop medication entirely, even when side effects are not extremely troublesome. Patients resist taking medicine when they feel well, they forget about it, they grow weary of a regimented program, especially if they sense disinterest on the part of the physician, or they get bad advice from well-meaning friends and neighbors. The incidence of patient failure is reduced if the patient is intelligent and has been thoroughly indoctrinated in the aims, objectives and importance of medical treatment. The recording of blood pressure at home is a strong deterrent to negligence in adhering to a therapeutic program. Again, the neurosurgeons have cause to criticize medical treatment, for patient failure is not a factor in the success or failure of surgical sympathectomy. If surgical treatment is successful, it reduces blood pressure whether the patient is cooperative or not; the benefit so obtained does not depend on fidelity to a strict regimen nor can it be revoked by capriciousness.

Palliation.—The forebearing patient and his conscientious physician derive no solace from the fact that present therapy for hypertension is palliative, not curative, and, therefore, all the associated tribulations and difficulties must be endured indefinitely if hypertension is to be controlled.

Patients should not be denied the benefits of hypotensive therapy simply because it is inconvenient and cumbersome. Experience in the use of antihypertensive agents makes the obstacles appear less formidable. Dissatisfaction with present therapy should, however, stimulate the search for more nearly ideal hypotensive agents. This quest eventually will unravel the mysteries of the cause of essential hypertension and lead ultimately to the discovery of its cure.

RAY W. GIFFORD, JR., M.D.

URINARY STRESS INCONTINENCE

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References

1. Ardran, G. M., Simmons, C. A., and Stewart, J. H.: The closure of the female urethra. J. Obst. & Gynaec. Brit. Emp., 63:26-35 (Feb.) 1956.
2. Lund, C. J., Benjamin, J. A., Tristan, T. A., Fullerton, R. E., Ramsey, G. H., and Watson, J. S.: Cinefluorographic studies of the bladder and urethra in women. I. Urethrovesical relationships in voluntary and involuntary urination. Am. J. Obst. & Gynec., 74:896-908 (Oct.) 1957.
3. Youssef, A. F., and Mahfouz, M. M.: Sphincterometrography: A new technic for studying the physiology and pathology of urinary continence in the female. J. Obst. & Gynaec. Brit. Emp., 63:19-25 (Feb.) 1956.
4. Lapides, Jack: Structure and function of the internal vesical sphincter. J. Urol., 80:341-353 (Nov.) 1958.
5. Lapides, Jack, Sweet, R. B., and Lewis, L. W.: Role of striated muscle in urination. J. Urol., 77:-247-250 (Feb.) 1957.
6. Kegel, A. H.: Progressive resistance exercise in the functional restoration of the perineal muscles. Am. J. Obst. & Gynec., 56:238-248 (Aug.) 1948.
7. Marshall, V. F., Marchetti, A. A., and Krantz, K. E.: The correction of stress incontinence by simple vesicourethral suspension. Surg. Gynec. & Obst., 88:509-518 (Apr.) 1949.
8. Berkow, S. G.: Paraurethral fixation for stress incontinence: Re-examination of its rationale, indications, and technic. Obst. & Gynec., 5:74-80 (Jan.) 1955.
9. Kelly, H. A., and Dumm, W. M.: Urinary incontinence in women, without manifest injury to the bladder: A report of cases. Surg., Gynec. & Obst., 18:444-450 (Apr.) 1914.
10. Kennedy, W. T.: Operative Technic for Stress Incontinence of Urine in the Female. In Carter, B. N.: Monographs on Surgery. Baltimore: Williams & Wilkins, 1952, pp. 74-81.
11. Ball, T. L.: Gynecologic Surgery and Urology. St. Louis: Mosby, 1957.
12. Symmonds, R. E.: Present concepts and management of urinary stress incontinence. S. Clin. North America. (In press.)
13. Ingelman-Sundberg, Axel: The Use of Pubococcygeal Muscles in the Repair of Stress Incontinence. In Carter, B. N.: Monographs on Surgery. Pp. 108-119, Baltimore: Williams & Wilkins, 1952.
14. Pacey, Kenneth: The pathology and repair of genital prolapse. J. Obst. & Gynaec. Brit. Emp., 56:1-15 (Feb.) 1949.
15. Counseller, V. S., and Symmonds, R. E.: Vesicourethral suspension for urinary stress incontinence: A study of the results obtained in 82 patients. Am. J. Obst. & Gynec., 75:525-532 (Mar.) 1958.

President's Letter

FORAND BILL SHELVED?

Thanks to the American Medical Association, the American Hospital Association, the American Dental Association, the Health Insurance Association of America and many Doctors of Medicine as individuals, the Forand Bill (H.R. 4700) has been shelved until next year. The bill is still before the House Ways and Means Committee but Representative Aime J. Forand stated that "I don't think we will be able to get this legislation to the floor before adjournment." However, he was "hopeful of action early next year." Therefore, we must still be on the alert.

It is encouraging to note that Arthur S. Flemming, Secretary of Health, Education and Welfare, told the Committee that "passage of the Forand Bill would mark the beginning of the end of voluntary insurance for the aged in the health field." He also stated that "instead of abandoning voluntary hospital insurance for the aged in favor of compulsory insurance, every possible effort should be made to determine whether or not a plan can be developed that will strengthen the voluntary approach."

The AMA's stand declared that voluntary methods are meeting the challenge of an expanding aged population and will continue to meet the challenge if given the continued opportunity. Dr. Frederick C. Swartz, Chairman of the AMA Committee on Aging, stressed that "medical care is not susceptible to production line techniques."

Labor believes that insurance has certain characteristics which inevitably will keep it from being an adequate form of protection against the health costs of the aged. Congressman Joseph E. Karth, Fourth District (Ramsey County), Minnesota, a union advocate, replied in a form letter to many local doctors who expressed to him their opposition to the Forand Bill. He believes that "organized medicine in its social posture is many years behind the remainder of the country" and he pointed "specificially to the instances of the reluctant acceptance by the AMA some years ago of Blue Cross-Blue Shield and more recently of closed panel practice." He also stated, "I'm sure you would agree that even Whitaker and Baxter would be hard pressed to put across successfully to the public the image of organized medicine as a dynamic force in our society."

I think that we all believe that medicine in America is second to none and primarily due to the preservation of free enterprise, but we shall have to fight to keep it that way. Representative Forand and others consider that "organized medicine, frankly, has deliberately defaulted its responsibility." This I do not believe, but nevertheless, that is the challenge.

In conclusion, Representative Karth has given us food for thought when he stated, "It seems to me that as a physician and as an acknowledged leader in your community, you also have the solemn responsibility, together with your colleagues, to develop a health care plan for our aged population which would be professionally adequate, expeditious, economically realistic, administratively simple and responsive to needs of patients and doctors, and above all compassionate and jealous of the precious dignity of older human beings." Therefore, we must accept this challenge and responsibility individually and collectively.

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President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

MINNESOTA BOARD OF MEDICAL EXAMINERS HAS BUSY YEAR IN 1958

The Minnesota State Board of Medical Examiners licensed 362 physicians during the past year. The average number over the years has been 372; the largest number licensed was 420 in 1947. Dr. F. H. Magney, Secretary of the Board, disclosed this figure in a report presented to the 1959 House of Delegates of the Minnesota State Medical Association at its annual meeting.

Of the 362 licensed in 1958, eighteen were foreign-educated. A total of 150 foreign-educated physicians have been licensed in Minnesota from 1949 to 1958. There has been only one failure in that group. The failures elsewhere have been much higher. The Board believes the reason is that great care is used here in checking the credentials of the applicants. All foreign applicants have been interviewed personally and individually by the Board.

The candidate must first pass the basic science examination. He must spend two years in an accredited hospital in Minnesota. Also, a large number have been doing graduate work at the University of Minnesota and at the Mayo Foundation. Eleven were graduated in medicine from the University of Minnesota and six were graduated from other approved American medical schools. All of these graduates from approved American medical schools are practicing in St. Paul, Minneapolis, Duluth and Rochester, at the present time.

Nineteen graduates from foreign medical schools are practicing in smaller towns; seventeen are in the larger cities; fifteen are in state and county hospitals; two are in the armed forces; thirty-nine have left the state and the location of two is unknown. Thus, the medical population has been increased by only 150 after much work on the part of the Board and its staff. The processing of these applications is expensive and time consuming.

Medical Directory Listings

The total number of names in the 1958 directory was 8,941. Of this number 7,514 were physicians, 4,219 of whom resided in Minnesota; 139 were osteopaths as against 162 in 1928; one osteopath being licensed in 1958; 547 were chiropractors of whom thirty-three were licensed in 1958; ten midwives and sixty-three masseurs and masseuses. There were also 233 registered physical therapists of whom fifty-three were registered in 1958 by the Medical Board. There were also 435 public health nurses.

The material for this directory is supplied by the Medical Board. Publication has been taken over by the Department of Administration from the State Board of Health. The charge is $1.50 per copy. Three supplements a year are provided by the Board.

Physician Deaths

Eighty-three registered physicians died during 1958. Of these, sixty-one lived in Minnesota. The average age at death was 66.34 years in 1958 and 68.08 in 1957. There was one death at age twenty-eight from peptic ulcer and one death from an airplane crash. Four died in automobile accidents between the ages of forty-one and forty-six years; there were nineteen deaths between fifty and fifty-nine years and fourteen deaths between sixty and sixty-eight years. Heart disease was the cause of death in thirty-nine cases; cerebral hemorrhage in seven deaths; pulmonary disease in seven cases and five from cancer.

Legal Activities

The Medical Board and its staff participates in much investigating, legal and disciplinary work. During the past year there were thirteen court cases with fourteen persons being involved. Five were abortion cases; two were violations of the basic science law; four involved fraud in obtaining drugs and narcotics; two for selling drugs in a place other than a pharmacy and one case of maintaining an office with no basic science certificate. Thirteen defendants were found guilty. One case was taken under advisement.

There are thirty-five stipulations in force in Minnesota. Stipulation means that a physician has violated some law or subjected himself to the danger of a suspension or revocation of his license. If the offense is not too serious, the physician is

given the opportunity of signing a stipulation that he will correct the conditions that led to the charges against him. Twenty-five of these stipulations were terminated during 1958.

The licenses of two physicians were suspended in 1958. There were no revocations. The most frequent charges are violations of the narcotic laws, personal use of narcotic drugs, barbital compounds, and the excessive use of liquor.

Legislation

Several amendments were made to the Medical Practice Act by the Legislature this year, after prior approval by the Council of the Minnesota State Medical Association. The annual registration fee was increased to $5.00 per year. The money is needed to permit the Board to carry out its duties under the law. The examination fee was increased to $35.00 so that new applicants would help to pay the cost of processing the applications. Effective July 1, 1960, the law requires one year of graduate hospital training as a prerequisite to being licensed. The law now permits the Medical Board to issue a temporary permit valid between examinations to a qualified applicant. This will do away with the delay for an applicant between examinations given by the Board. The Board was also given discretionary power to admit to licensure a person from another state who is fully qualified and licensed in that state.

The Legislature also fixed the per diem of Board members at $50.00. The compensation of the Secretary of the Board was set at not to exceed $4,800 per year, with the Board given the authority to determine the exact amount.

The Governor recently appointed to the Board, Dr. R. O. Sather of Crookston and Dr. I. L. Oliver of Graceville, both of whom were nominated by the Council.

EIGHT THOUSAND NEW DOCTORS LICENSED IN UNITED STATES DURING 1958

Almost 8,000 new physicians were licensed to practice medicine in the United States during 1958, it was reported May 29 by the American Medical Association's Council on Medical Education and Hospitals. In its fifty-seventh annual report, the council said that this marks the sixth consecutive year in which more than 7,000 new physicians were licensed. Of the 7,809 new doctors, 6,155 were licensed through written examinations and 1,654 by endorsement of credentials. During the period, there were approximately 3,700 physician deaths reported to the American Medical Association, which reduces the overall gain in the doctor population to 4,109.

In all, 15,240 licenses to practice medicine were issued in 1958. Written examinations accounted for 7,315 licenses and 7,925 were given through reciprocity and endorsement of credentials. Of these, California issued the greatest number—2,205, New York was next with 1,584. Illinois, Ohio, Pennsylvania, and Texas each registered more than 500 doctors. Nine states—Alaska, Delaware, Idaho, Montana, Nevada, North and South Dakota, Vermont, and Wyoming—issued less than fifty licenses during the year. Among the territories and possessions, Puerto Rico licensed 107, Hawaii 44, Canal Zone 6, Guam and the Virgin Islands 2 each. The Council said there was an increase of 104 in the total number of licenses issued in 1958 over the previous year.

During the year, there were 8,633 applicants for licensure by written examination. Of these 7,268 passed and 1,365 failed. Among those examined were 5,692 graduates of approved medical schools in the United States, 168 from Canada, one graduate of an approved medical school in the United States which is no longer in operation, 2,567 from foreign schools, twenty-five graduates of unapproved medical schools in the United States which are no longer in existence, and 180 graduates of schools of osteopathy.

Twelve approved medical schools in the United States had no failures among their graduates who were examined. These include Stanford University, Chicago Medical School, University of Chicago, Boston University, Wayne State University, University of Mississippi, University of Missouri, University of Nebraska, Albany Medical College, University of Oregon, University of Pittsburgh, and the University of Utah.

The number of new licenses issued on the basis of geographical areas were: New England, 470; East North Central, 1,447; Middle Atlantic, 1,708; West North Central, 784; South Atlantic, 1,184; East South Central, 446; West South Central, 748; Mountain, 129; Pacific, 790, and territories and possessions, 103.

MEDICARE BENEFITS EXCEED $185 MILLION MARK

Medicare benefits paid to members of the uniformed forces from December 6, 1956, to June 30, 1959, have totaled $185,400,000. This amount includes $91,000,000 for hospital care and $94,000,000 for doctors' fees.

Medicare was established in 1956 by an act of Congress to pay for civilian medical care for dependent spouses and children of members of the Army, Navy, Air Force, Marines, Coast Guard, Commissioned Public Health Service, and Coast and Geodetic Service.

The Office for Dependents' Medical Care recently submitted its second annual Medicare report to Congress. This report revealed that in 1958, hospital admissions of military dependents totaled 664,000 compared with 651,000 in 1957.

Fifty-two per cent of the 1958 total entered private hospitals and 48 per cent in service institutions. Maternity cases involving some 264,000 deliveries accounted for 40 per cent of the admissions. Claims of physicians totaling $234,974 yielded an aggregate of $17,580,352 between July 1, 1957, and December 31, 1957. The figure rose sharply to 366,566 and $27,795,009 respectively during the first half of 1958. A sharp decline in physicians' claims during the second half of 1958 was noted. During this period, the number of claims dropped to 274,251 with an estimated dollar value of $21,342,488. This decline was due to curtailed benefits previously available to Medicare claimants.

States whose Medicare physician fees exceeded the multi-million dollar mark during the July to December, 1958, period include: California with $3,923,376 and Texas with $2,170,595.

Formal protests were made by a number of state medical associations against the restriction imposed on Medicare benefits in October, 1958. Principal objections included: interference with patients' free choice of physician; too abrupt a change in benefits and procedures; difficulty in administering changes; and imposition of additional paperwork burdens on the doctor.

Physicians and Medicare dependents frequently misinterpret the purpose of Medicare permit (DD Form 1251). This form is issued to dependents living with their sponsors when military medical facilities are not available or inadequate and it entitles the holder to authorized service only and not unlimited care by civilian physicians.

DOCTOR WINS FEDERAL TAX CASE

A Texas federal district judge has ruled that Dr. Sidney Galt, a senior partner in the Southwest Clinic Association in Dallas, need not pay income taxes as an individual on undistributed profits; but, rather, such profits should be taxable as if the Association were a corporation, rather than a partnership.

Some observers have expressed the opinion that an early Internal Revenue Service appeal of the decision of District Judge T. Whitfield Davidson may be expected.

The case climaxed more than four years of litigation between Doctor Galt and the Internal Revenue Service. Judge Davidson ordered refunded income taxes paid by Doctor Galt on the basis of partnership in the association which the Internal Revenue Service contended was a partnership. Doctor Galt contended that doctors belonging to the partnership should be taxed only on salaries and bonuses paid them and not on association profits. He said the undistributed profits should be taxed just like those of a corporation.

Dallas attorney, George Ray, pointed out that the decision was a precedent-setting income tax case which would affect doctors, lawyers, architects and others selling personal service. Attorney Ray further pointed out that Judge Davidson's decision will permit doctors to organize an association rather than partnerships and have all the benefits of a corporation under the federal income tax law. He further pointed out that pension funds and other benefit programs can be set up within the organizations.

CONVICTED NATUROPATH MAKES SUPREME COURT APPEAL

A Texas naturopath convicted of unlawful practice of medicine by a San Antonio jury has petitioned the United States Supreme Court to review his conviction.

The jury has prescribed a $500 fine and ordered the naturopath to serve a thirty-day jail sentence. Briefs filed with the United States Supreme Court indicate that the activities of Lonnie Keahey, N.D., began with his diagnosis of the pain of an undercover policeman attributable to "stomach gases." His treatment consisted of a potion drawn from shelf drugs. For this treatment, the under-cover policeman received a bill for $4.00.

The result—arrest and conviction of one naturopath.

HAWAII IS A HEALTHFUL STATE

Hawaii, our fiftieth state, has an excellent health record, reports the Statistical Bulletin of the Metropolitan Life Insurance Company.

The report points out that this excellent record reflects in a large measure advances in medical practice, improvement in environmental sanitation, and a general rise in living standards. The marked degree of control gained over the infectious diseases is an especially bright feature of the record. For example, tuberculosis mortality in the civilian population was down to the very low rate of 3.1 per 100,000 in 1957, a decrease of more than 50 per cent in two years and of about 95 per cent since 1940. The death rate from influenza and pneumonia in 1957, despite the widespread prevalence of upper respiratory infection that year, was only 25.6 per 100,000—half that recorded in 1940. At the same time, the principal communicable diseases of childhood (measles, scarlet fever, whooping cough, and diphtheria) and typhoid fever have been practically eliminated as causes of death.

Striking progress has been achieved in safeguarding infant life and making childbearing safer in Hawaii. The infant mortality rate in 1957 was 24 per 1,000 live births, compared with 44 in 1940. Furthermore, the loss of life in infancy is being increasingly concentrated in the first four weeks after birth, when mortality is least amenable to control. Currently, three fourths of the infant deaths in Hawaii occur during the first month; in 1940 the proportion was three fifths. Maternal mortality dropped from 2.4 per 1,000 live births in 1940 to 0.4 in 1957. During this period, the proportion of births occurring in hospitals rose from 70 to 99 per cent.

The leading causes of death in Hawaii are much the same as those in continental United States. Heart disease ranks first by a considerable margin, accounting for about a third of the total mortality in 1957. The cardio-vascular-renal diseases of the arteries—were responsible for nearly half the total. Cancer and other malignant neoplasms ranked second to heart disease, with one sixth of all deaths. Next in order of numerical importance were diseases of early infancy, accidents, and influenza and pneumonia.

Although accidents rank fifth at all ages combined, they outrank by a considerable margin every other cause at ages one to twenty-four years, being responsible for nearly a third of the total mortality in this age group. Nearly 45 per cent of the fatal accidents at ages one to twenty-four result from injuries in motor vehicle accidents. Beginning with ages twenty-five to forty-four, heart disease is the leading cause of death and cancer is second in rank. The proportion of all deaths attributed to heart disease rises from one quarter at ages twenty-five to forty-four to somewhat over one third at ages forty-five to sixty-four, and to nearly half at ages sixty-five and over. Cancer is responsible for about one fifth the total mortality at each of these age groups.

Longevity in Hawaii compares very favorably with that for continental United States, according to the life table for 1949-51, the latest available for Hawaii. The average length of life for men in Hawaii was 67.76 years, or two and one-quarter years more than the men on the mainland. The average for women was 71.29 years, or slightly above that for women in the United States.

BRONCHIAL CLOSURE

(Continued from Page 1232)

References

1. Rienhoff, W. F., Jr. et al: Closure of the bronchus following total pneumonectomy—Experimental and clinical observations. Ann. Surg., 116:481, 1942.
2. Gaffi, F. S. and Goncalves, E. L.: Closure of the bronchial stump after pneumonectomy. Surgery, 42:511, 1957.
3. Lynn, R. B.: The Bronchus Stump. J. Thoracic Surg., 36:70, 1958.
4. Brewer, L. A. et al: Bronchial closure in pulmonary resection: A clinical and experimental study using a pedicled pericardial fat graft re-enforcement. J. Thoracic Surg., 26:507, 1953.
5. Nicks, Rowan: Restoration and reconstruction of the trachea and main bronchi. J. Thoracic Surg., 32:226, 1956.
6. Madsen, E. T.: An experimental and clinic evaluation of surgical suture materials. Surg. Gyn. & Obst., 97:73, 1953.
7. Koontz, A. R. and Kimberly, R. C.: Tissue reaction to tantalum gauze and stainless steel wire gauze: An experimental comparison. Ann. Surg., 137:833, 1953.
8. Conklin, Wm. S.: Personal communication.
9. Bjork, V. O.: Suture material and technique for bronchial closure and bronchial anastomosis. J. Thoracic Surg., 32:22, 1956.
10. Sherman, P. H. and Conant, J. S.: Bronchial closure with catgut sutures. J. Thoracic Surg., 35: 363, 1958.
11. Chamberlain, J. M. et al: Segmental resection for pulmonary tuberculosis (300 Cases). J. Thoracic Surg., 26:471, 1953.
12. Metros, H., et al: Bronchial suture. Am. Rev. Tuberc., 75 (abstracts) 127, 1957.
13. Jones, J. C.: Closure of the bronchus in pulmonary resection. Am. Rev. Tuberc., 51:55, 1945.
14. Keyes, T. F.: Braided tantalum as a bronchial suture material. J. Thoracic Surg., 27:291, 1954.
15. Sweet, R. H.: Closure of the bronchial stump following lobectomy or pneumonectomy. Surgery, 18: 82, 1945.

The Art of Medicine

PR

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Editor

HOW DO YOU RATE? SURVEY POINTS UP HOW M.D.'s STAND WITH PUBLIC

A recent survey by the Hartford County (Connecticut) Medical Society on what local citizens think of their doctors indicated that while people approve of the quality of medical care they receive, they have other opinions about the cost of it.

On the whole the survey turned up *favorable views on the availability of physicians* (81 per cent said they never had trouble getting a doctor when they needed one) and the competency of their physicians (91 per cent considered that the care rendered by their family doctor was either good or excellent).

In the matter of costs, 77 per cent thought doctors' charges were about right for office calls and 70 per cent believed that current home calls were reasonable. However *only 46 per cent considered surgical charges about right,* while 16 per cent (mostly in the lower income group) believed they were too high. More people (43 per cent) disapproved of prescription prices than approved (39 per cent). Views on whether or not hospital costs were too high ran about 50-50.

Although the trend in recent years has been toward billing patients by itemized statement, 52 per cent of the sample indicated they did not receive itemized bills from their doctors, while 39 per cent said they did. Strangely, only 28 per cent said they actually wanted their bills itemized.

One significant fact the survey turned up—and one which probably applies to other societies as well—was that only 40 per cent of those questioned had ever heard of the Hartford County Medical Society. Most of those who had were in the upper income group. Even more disturbing was the fact that *83 per cent had never heard of the society's emergency call service* which indicates that a good deal of publicity is in order for this phase of the organization's activities.

JAYCEES FOR HEALTH

Local Jaycee chapters throughout the country are again this year being supplied with *guides for community health activities.* The ten-phase program, prepared in co-operation with a special committee of the AMA, covers projects dealing with immunization, flouridation, health forums, recreation for mental hospitals, health services directories, accidental poisoning, handicapped children, health fairs, alcoholism and rabies. Suggested projects in each area are outlined in separate how-to-do leaflets available on request from the U. S. Junior Chamber of Commerce, P. O. Box 7, Tulsa 2, Oklahoma. Physician Jaycees should encourage their chapters to make use of the guides.

IN THE INTEREST OF BETTER PRESS RELATIONS

The Louisiana State Medical Society recently presented its first annual press award to the *New Orleans States-Item* for an editorial and news campaign to have stray dogs given to medical schools for scientific research.

The award was accepted by Editor Carl Corbin, Louisiana State Medical Society public relations chairman, Doctor Richard L. Buck, said in making the presentation "we salute you and the *States-Item* for the contribution your newspaper has made to the advancement of medical science."

Also singled out for recognition by the medical society was the weekly newspaper *Plaquemines Gazette* for "unrelenting opposition to socialism in general and socialized medicine in particular." The *Baton Rouge State-Times and Morning*

Advocate were mentioned by the state society for excellent coverage of medical news.

This is another example of what can be done by county medical societies to give credit where credit is due.

AMBULANCE INSPECTION HELD In order that Broome County, New York, residents could be assured of proper ambulance service in an emergency, the county medical society recently promoted an ambulance inspection day.

According to accounts of the project, fifteen ambulances from around the county gathered in a factory parking lot and underwent an examination by representatives of the medical society, Red Cross and police officers. Each satisfactorily equipped vehicle received a certificate from the chairman of the state medical committee on first aid and transportation of the injured.

Public acceptance of the project was considered overwhelming by its sponsors. Activities of the event were well covered by area press, radio and television, and the resulting public relations value was apparent. Advance notification of the event was given to ambulance agencies regarding inspection requirements. Reports show that all but one were able to secure the proper equipment in time to pass the test. Public recognition was given to the ambulance drivers, many of whom are volunteers.

ANNOUNCING VACATION SCHEDULES "Medical men need vacations, too" was the theme of an announcement placed in Dolphin County (Pennsylvania) newspapers to announce vacation schedules of members of the county medical society. The announcement went on to describe the arrangements made by members of the society to guarantee their patients adequate emergency medical care during their absence. Also listed in the announcement was the society's emergency call number.

OFFICE HOURS Patients do appreciate having office data in printed form for a quick reference. A number of county medical societies have prepared a white card (five by six inches) that lists the hours during which each doctor is on duty as well as home and emergency telephone numbers.

County societies which have adopted such a plan report that patient reception to this gesture is excellent.

Clinical Sessions and Annual Meetings

Also reported as highly successful is the policy adopted by physician groups in a number of areas throughout the nation who place signs—furnished by the county medical society—on their doors explaining that they were furthering their medical education by attending either a Clinical Session or a State Medical Association meeting.

Those who have observed the use of this method of informing patients have expressed the opinion that the plan boosted attendance at Clinical Sessions as well as improving doctor-patient relationships.

"IT'S A MATTER OF CHOICE" "It's a matter of choice"—a timely sound motion picture film which explains the facts about our social security system has been produced by the United States Chamber of Commerce.

The twenty-six-minute film clarifies the social security system as Congress intended it. Also explained in the film are the dangers of making the social security program a political football with benefits boosted each election.

One review of the film points out that in light of the current Forand Bill situation, the film has a particularly timely illustration of the American Medical Association's point of view.

Why not plan to book the film for your county medical society meeting or better yet, suggest the showing to a civic organization in your community.

For bookings of "A Matter of Choice," write to Modern Talking Picture Service, Inc., 3 East 54th Street, New York 22, New York. List a preferred and an alternate date. There is no charge for use of this film.



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Doses of 5 to 10 mg., repeated at intervals of six to eight hours, provide excellent relief all day. In patients who are unable to retain oral medication when first seen, Mornidine may be administered intramuscularly in doses of 5 mg. (1 cc.).

Mornidine is supplied as tablets of 5 mg. and as ampuls of 5 mg. (1 cc.).

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Public Health

DEPARTMENT OF HEALTH LISTS RESULTS OF ORAL POLIO VIRUS VACCINE STUDY

Twenty-five infants (born to mothers immunized during pregnancy with two doses of Salk vaccine) ranging in age from four days to six months, were fed living attenuated poliomyelitis virus type I (SM strain), type III (Fox strain), and type II (MEF_1 strain) at intervals varying from three to eleven weeks during 1957. Fourteen infants of less than two weeks in age were vaccinated against all three types of virus. All demonstrated satisfactory antibody response at approximately two months of age.

When the orally vaccinated group was compared to a similar group of infants inoculated with Salk vaccine, the antibody response to the attenuated virus was found to be as good or better for types I and III but poorer for type II. Evidence of spread to other members of the family exclusive of the father was determined by significant antibody rise or isolation of virus from the stool. Spread to siblings was sixty-eight per cent for type I, sixteen per cent for type II, and sixty per cent for type III.

A total of 551 persons (288 adults and 263 children) comprising 150 families in Como Village, southeast Minneapolis, were given orally administered vaccine in capsules at three-week intervals in a second study conducted in 1958. One-half received placebo and one-half received vaccine identical to that given to the infants except that the dosage of type II was increased.

The orally administered attenuated polioviruses used in this study are clearly effective as antigens for children. This effectiveness obviously extends to all three types. When measured by a crude bettering of an original antibody titer of less than four, these viruses were effective in inducing such a change in approximately eighty-five to ninety per cent of the participants. When measured by a stricter and (from the laboratory standpoint) a more significant criterion of at least a sixteen-fold rise in titer, the effectiveness is still apparent in approximately seventy per cent. The attenuated viruses used were like naturally occurring viruses in all respects except that they do not produce clinical disease.

Although the vaccine is less effective in adults, a trend is suggested in that the virus-fed group always had better conversion rates than the placebo-control group. When the upward trend of antibody titers in adults is measured for statistical significance on the basis of sixteen-fold increments, the difference in response between the placebo-control group and the virus-fed group are statistically significant for all types. While differences are not as great as those occurring in children, they are not accidental.

The Como Village studies stimulated a study now underway in Grove East Village, St. Paul. Its purpose is to determine if antibody production is as effective when all three types of virus are given at once as when each type is given separately. Half of the about 230 participants (comprising approximately sixty-five families) will get a single dose of trivalent liquid vaccine that includes the attenuated virus of all three types of polio in greater concentration than in previous tests. Feeding of vaccine is completed and laboratory testing is now in progress to determine antibody response.

In all three studies, stool and blood specimens were collected at appropriate intervals. There have been no untoward effects or clinical illnesses which could be attributed to the vaccines.

Plans have been made for a fourth study involving approximately 180 men at the St. Cloud Reformatory. The purpose is to determine whether gastric acidity plays a part in lessening the effectiveness of the oral vaccine in adults as compared to children and to study the pathogenesis of poliomyelitis. Like all previous studies, this is supported with grants from the Sister Elizabeth Kenny Foundation and Lederle Laboratories.

More than 1,000,000 doses of the live attenuated vaccine have been given to more than 550,000 people in Latin America to March 10, 1959. Of these, 250,000 have been given all three types with no bad effects.

HUMAN GENETICS COUNSELING PROGRAM AUTHORIZED

The 1959 Minnesota Legislature passed enabling legislation which will permit the Minnesota Department of Health to establish a human genetics program for counseling, education, and research on physical or mental abnormalities related to heredity. No funds were appropriated, but the act authorizes the State Board of Health to accept federal grants and gifts from private organizations or individuals to support work in human genetics. This law also provides for appointment of a nine-member advisory committee on human genetics by the State Board of Health.

Under the act, the State Health Department is authorized to collect and interpret data concerning human hereditary diseases, including the effect of increased radiation on heredity; conduct research on genetic problems; offer heredity counseling to families; and carry on a public information service.

(Turn to Page 1296)



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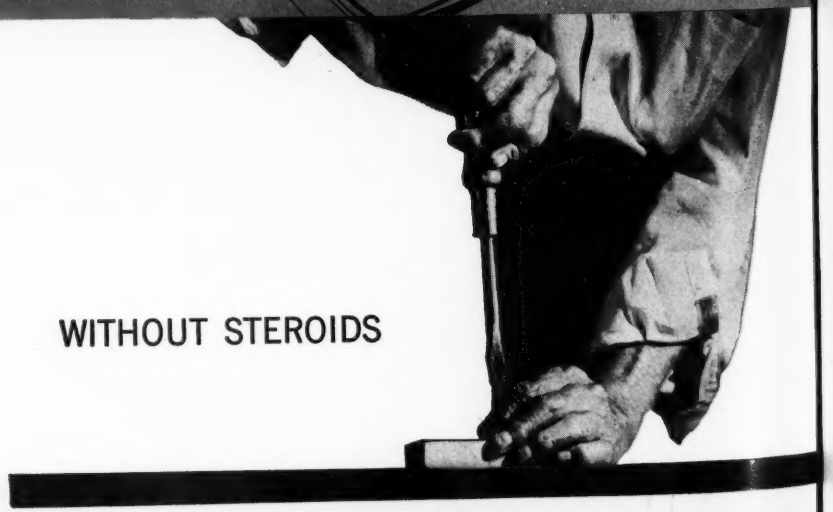


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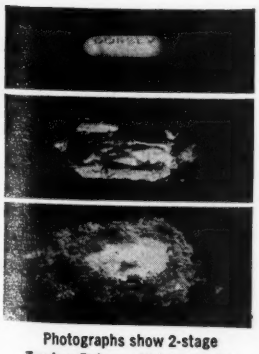
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In the stomach, the outer layer quickly releases the buffer, which protects against nausea, dyspepsia and other gastrointestinal symptoms so frequently encountered with salicylates alone. The core of Buffered Pabirin then disintegrates rapidly, permitting rapid absorption of the acetylsalicylic acid for faster pain relief.



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Ascorbic acid ..... 50 mg.
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All Buffered Pabirin is sodium- and potassium-free.

Dosage: Two or three tablets 3 or 4 times daily.

References: 1. Hart, D.; Bagnall, A. W.; Bunim, J. J., and Polley, F. H.: Ninth International Congress on Rheumatic Diseases, Toronto, Ont. (June 25) 1957. 2. Report of Joint Committee, Medical Research Council & Nuffield Foundation, Treatment of Rheumatoid Arthritis, British Medical Journal (April 13) 1957. 3. Friend, D. G.: New England J. Med. 257:278 (Aug.) 1957.

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HUMAN GENETICS COUNSELING PROGRAM AUTHORIZED

(Continued from Page 1292)

The program will develop as funds permit through the department's division of special services, directed by Dr. A. B. Rosenfield.

The legislation was authored by State Senator Alf Bergerud, Minneapolis, as well as Representatives Clifton Parks, St. Paul; Sally Luther, Minneapolis; and Howard Ottinger, Chaska. It was passed by a unanimous vote of both the Senate and the House. The measure was actively supported by the Dight Institute of Human Genetics, University of Minnesota, and the Minnesota Human Genetics League. It is one of about twenty such centers in the nation, according to Dr. Sheldon C. Reed, director of the Dight Institute.

As the State Health Department's program in human genetics develops, the institute is expected to be able to expand its research and teaching programs in the medical school. The Health Department program will also provide heredity counseling to adoption and similar agencies. It will also give assistance to physicians through consultation on individual cases, seminars on medical genetics, and distribution of educational materials. The Department will work co-operatively with state and national agencies studying human genetics, including the U. S. Public Health Service and the U. S. Children's Bureau.

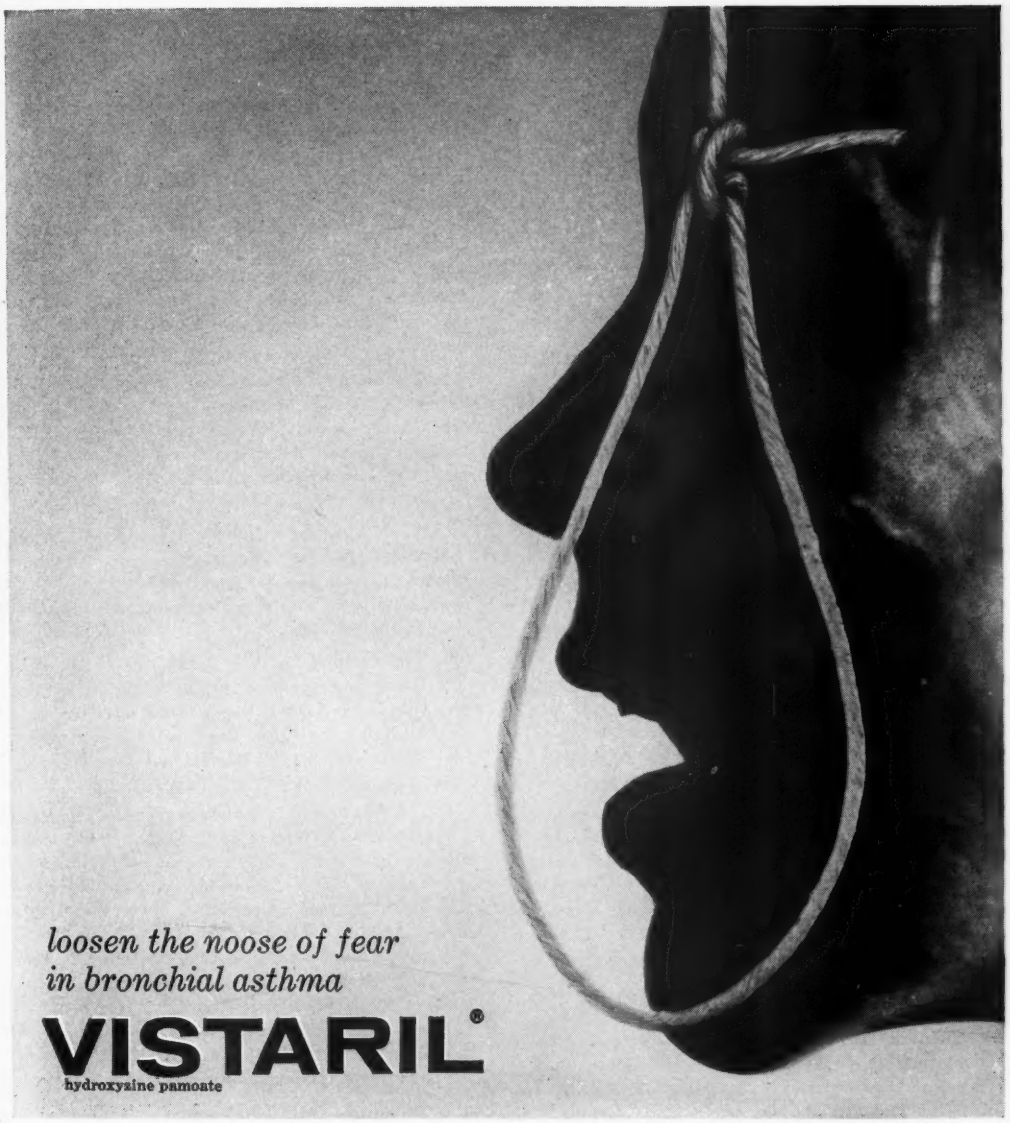


STEREOTACTIC SURGERY IN PARKINSON'S DISEASE

(Continued from Page 1218)

References

1. Horsley, V., and Clarke, R. H.: The structure and functions of the cerebellum examined by a new method. Brain, 31:45-124, 1908.
2. Spiegel, E. A., Wycis, H. T., Marks, M., and Lee, A. J.: Stereotaxic apparatus for operations on the human brain. Science, 106:349-350, 1947.
3. Spiegel, E. A. and Wycis, H. T.: Thalamotomy and mesencephalotomy: neurosurgical aspects. New York J. Med., 49:2273-2277, 1949.
4. Spiegel, E. A. and Wycis, T. T.: Ansotomy in paralysis agitans. A.M.A. Arch. Neurol. & Psych., 71:598-641, 1954.
5. Spiegel, E. A. and Wycis, H. T.: Thalamotomy and pallidotomy for treatment of choreic movements. Acta neurochir., 2:417-422, 1952.
6. Kurland, L. T. and Mulder, D. W.: Epidemiology: Incidence, geographic distribution, and genetic considerations of parkinsonism. Presented at 6th Annual Meeting of Houston Neurological Surgery Society, Houston, Texas, March 13, 1958.
7. Jenkner, F. L. and Ward, A. A., Jr.: Bulbar reticular formation and tremor. A.M.A. Arch. Neurol. & Psych., 70:489-502, 1953.
8. Ward, A. A., Jr., McCulloch, W. S., and Magoun, H. W.: Production of alternating tremor at rest in monkeys. J. Neurophysiol., 11:317, 1948.
9. Horsley, V.: The function of the so-called motor area of the brain. Brit. M.J., 2:125, 1909.
10. Bucy, P. C.: Cortical extirpation in the treatment of involuntary movements. Res. Publ., Assoc. Nerv. & Ment. Diseases, 21:551-595, 1940.
11. Klemme, R.: Surgical treatment of dystonia. Res. Publ., Assoc. Nerv. and Ment. Diseases, 21:596-601, 1940.
12. Meyers, R.: Surgical procedure for postencephalitic tremor with notes on the physiology of premotor fibers. Arch. Neurol. & Psych., 44:455, 1940.
13. Bucy, P. C.: Relationship of the pyramidal tract and abnormal involuntary movements. 1st. Internat. Congress, Neurology, Brussels, 1957.
14. Browder, J.: Section of the fibers of the anterior limb of the internal capsule in parkinsonism. Am. J. Surg., 75:264-268, 1948.
15. Walker, A. E.: Cerebral pedunculotomy for the relief of involuntary movements. II. Parkinsonian Tremor. J. Nerv. & Ment. Dis., 116:766, 1952.
16. Oliver, L. C.: Parkinson's disease and its surgical treatment. p. 87, London, Lewis, 1953.
17. Putnam, T. J.: Relief from unilateral paralysis agitans by section of the lateral pyramidal tract. Arch. Neurol. & Psych., 40:1049, 1938.
18. Gardner, W. J.: Surgical aspects of parkinson's syndrome. Postgrad. Med., 5:107-111, Feb., 1944.
19. Cooper, I. S.: Surgical occlusion of the anterior choroidal artery in parkinsonism. Surg. Gynec. & Obst., 99:207, 1954.
20. Spiegel, E. A. and Wycis, H. T.: Stereoencephalotomy (thalamotory and related procedures). Part I. Methods and stereotaxic atlas of the human brain. New York: Grune & Stratton, 1952.
21. Blundell, J. E.: Variability of size and position of the basal ganglia in man. Presented at 6th Annual Meeting of Houston Neurological Surgery Society, Houston, Texas, March 13, 1958.



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Meetings and Announcements

STATE

Minnesota Academy of General Practice, Fall Refresher, Radisson Hotel, Minneapolis, Minnesota, September 22-23, 1959. For reservations and further information, write: Matthew K. Plasha, M.D., Chairman, Coon Rapids Clinic, Coon Rapids, Minnesota.

Minnesota Public Health Conference, 1959 Program, Radisson Hotel, Minneapolis, Minnesota, September 24. Registration 8:00 a.m.; program begins 9:30 a.m.

NATIONAL

Academy of Psychosomatic Medicine, Sixth Annual Meeting, October 15-17, 1959 at the Sheraton-Cleveland Hotel, Cleveland, Ohio. For further information contact Dr. Bertram B. Moss, Suite 1035, 55 East Washington Street, Chicago 2, Illinois.

American College of Surgeons, Annual Clinical Congress, Atlantic City, New Jersey, September 28-October 2. Dr. Michael L. Mason, Secretary, 40 East Erie Street, Chicago 11, Illinois.

American Heart Association, Annual Meeting and Scientific Sessions, October 23-27, 1959, Philadelphia. Scientific Sessions scheduled for October 23-25 at Trade and Convention Center. Annual Meeting of the National Assembly, Hotel Bellevue Stratford, October 26-27. Information available from Minnesota Heart Association, 1821 University Avenue, St. Paul 4, Minnesota.

The annual course in Postgraduate Gastroenterology, sponsored by The American College of Gastroenterology, will be given at The Biltmore in Los Angeles, California, September 24, 25 and 26, 1959. For further information and enrollment, write to the American College of Gastroenterology, 33 West 60th Street, New York 23, New York.

The Academy of Psychosomatic Medicine has announced its Sixth Annual Meeting, October 15-17, 1959, at the Sheraton-Cleveland Hotel in Cleveland. For further information, write to Dr. Bertram B. Moss, Suite 1035, 55 East Washington Street, Chicago 2, Illinois.

The American Rhinologic Society will hold its fifth annual meeting in the Belmont Hotel, Chicago, October 10. The meeting will be preceded by a surgical seminar in the Illinois Masonic Hospital, Chicago, October 7-9. For further information write to Dr. Robert M. Hansen, Secretary, 1735 No. Wheeler Avenue, Portland 12, Oregon.

Association of American Medical Colleges, annual meeting, Edgewater Beach Hotel, Chicago, Illinois, November 2-4, 1959. For further information, write Ward Darley, M.D., Executive Director, 2530 Ridge Avenue, Evanston, Illinois.

Interstate Postgraduate Medical Association, Forty-fourth Scientific Assembly, Palmer House, Chicago, Illinois, November 2-5, 1959.

Institute of Industrial Medicine of New York University Post-Graduate Medical School, two-month course for physicians in Occupational Medicine. Presentations include Preventive Medicine, Administrative Medicine, Occupational Diseases, and Industrial Hygiene. The course will be a full-time, two-month course, September 14 through November 6, 1959, tuition—$375, field trip expense—$25. For applications, address Office of the Associate Dean, New York University Post-Graduate Medical School, 550 First Avenue, New York 16, New York.

Fourth National Cancer Conference, September 13-15, 1960, Minneapolis, Minnesota. Sponsored by the American Cancer Society, Inc., and the National Cancer Institute. Theme: Changing Concepts Concerning Cancer. For further information, write: Medical Affairs Department, American Cancer Society, 521 West 57th Street, New York 19, New York.

Mississippi Valley Medical Society, Twenty-fourth Annual Meeting, Chase Hotel, St. Louis, Missouri, September 29-October 1. Complete programs available from Dr. Harold Swanberg, M.D., Secretary, W. C. U. Building, Quincy, Illinois.

National Society for Crippled Children and Adults, Annual Convention, November 29-December 2, 1959, Palmer House, Chicago. For further information, write Miss Catharine Bauer, Director of Information, 2023 West Ogden Avenue, Chicago 12, Illinois.

Pan-Pacific Surgical Association, Eighth Congress, Honolulu, Hawaii, September 28 through October 5 in 1960. Further information and brochures may be obtained by writing to Dr. F. J. Pinkerton, Director General of the Pan-Pacific Surgical Association, Suite 230, Alexander Young Building, Honolulu 13, Hawaii.

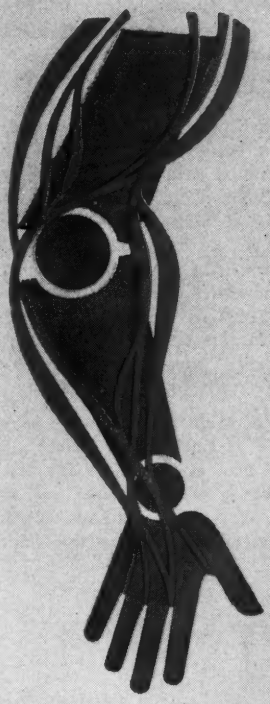
A Postgraduate Course in Occupational Skin Problems will be given at the Institute of Industrial Health to be held at the University of Cincinnati, Cincinnati, Ohio, October 26-30, 1959. For further information, write to the Secretary, Institute of Industrial Health, The Kettering Laboratory, Eden and Bethesda Avenues, Cincinnati 19, Ohio.

Twelfth Annual Meeting of the American Association of Blood Banks, Edgewater Beach Hotel, Chicago, Illinois, November 4-7, 1959. For further information write, Office of the Secretary, American Association of Blood Banks, 30 North Michigan Avenue, Chicago 2, Illinois.

Twelfth Annual Conference on Electrical Techniques in Medicine and Biology, Sheraton Hotel, Philadelphia, Pennsylvania, November 10-12, 1959. For further information, write Dr. Herman P. Schwan, Moore School of Electrical Engineering, University of Pennsylvania, Philadelphia, Pennsylvania.

Eighty-seventh Annual Meeting of the American Public Health Association, Atlantic City Convention Hall, Atlantic City, New Jersey, October 19-23, 1959.

(Continued on Page 1300)



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(Continued from Page 1298)

INTERNATIONAL

Eighth Bahamas Medical Conference, British Colonial Hotel, Nassau, Bahamas, November 27 until December 17, 1959.

North American Federation, International College of Surgeons, twenty-fourth annual congress, Palmer House, Chicago, September 13-17, 1959. For further information, write to the Secretariat, International College of Surgeons, 1516 Lake Shore Drive, Chicago 10, Illinois.

Second Bahamas Surgical Conference, British Colonial Hotel, Nassau, Bahamas, December 28, 1959 until January 16, 1960.

International College of Surgeons, Twelfth Biennial International Congress, Rome, Italy, May 15-18, 1960.

Fourth International Goiter Conference, July 5-9, 1960, London, England, under the auspices of the London Thyroid Club and the American Goiter Association. Application blanks are available from John C. McClintock, M.D., 149½ Washington Avenue, Albany 10, New York, U.S.A.

Pan American Medical Association Congress, Mexico City, Mexico, May 2-11, 1960. For further information, write Dr. Joseph J. Eller, Director General, 745 Fifth Avenue, New York, New York.

Pan-Pacific Surgical Association, Eighth Congress, Honolulu, Hawaii, September 27 to October 5, 1960. For further information, write to The Pan-Pacific Surgical Association, Travel Headquarters, 36 South Wabash Avenue, Chicago 3, Illinois.

International Congress of Gastroenterology, sixth meeting, Leyden, Netherlands, April 20-24, 1960. Patron: His Royal Highness the Prince of the Netherlands.

United States Section, International College of Surgeons, two-week post-graduate course in General Surgery, in co-operation with the Cook County Graduate School of Medicine. Course begins November 2. Applications should be addressed to Mr. John W. Neal, Registrar, Cook County Graduate School of Medicine, 707 South Wood Street, Chicago 12, or to Doctor Ross T. McIntire, Executive Director, International College of Surgeons, 1516 Lake Shore Drive, Chicago 10, Illinois.

NORTHERN MINNESOTA MEDICAL ASSOCIATION

The Northern Minnesota Medical Association will meet September 11 and 12, in Duluth. All scientific sessions will be held at St. Luke's Hospital. The program will include a geriatric panel, including Doctors S. W. Arhelger, W. S. Neff, and L. R. Gowan. The Friday evening dinner will be held at the Northland Country Club.



SOUTHERN MINNESOTA MEDICAL ASSOCIATION

The Southern Minnesota Medical Association will meet September 14 at Mann Hall, Medical Science Building, Rochester, Minnesota. Registration will begin at 8:30 a.m. The opening session is scheduled for 9:00 a.m. Dr. Benjamin B. Souster, President of the Minnesota State Medical Association, will be the banquet speaker for the occasion.

MEETINGS OF THE AMERICAN COLLEGE OF SURGEONS

January

Sectional Meeting, The Brown Hotel, Louisville, Kentucky, January 21, 22, 23. Dr. Rudolf J. Noer, local chairman. Address inquiries to: Dr. H. P. Saunders, 40 East Erie Street, Chicago 11, Illinois.

February

Four-Day Sectional Meeting for Surgeons and Nurses, The Statler Hilton, (Surgeons' Headquarters) and Sheraton-Plaza (Nurses' Headquarters), Boston, Massachusetts, February 29, March 1, 2, 3. Dr. Claude E. Welch, local chairman. Dr. Anne Kibrick, chairman, nurses program. Address inquiries to: Dr. H. P. Saunders, 40 East Erie Street, Chicago 11, Illinois.

March

Sectional Meeting, The Broadmoor, Colorado Springs, Colorado, March 21, 22, 23. Dr. Edward H. Vincent, local chairman. Address inquiries to: Dr. H. P. Saunders, 40 East Erie Street, Chicago 11, Illinois.

Sectional Meeting, Sheraton-Portland Hotel, Portland, Oregon, March 28, 29, 30. Dr. Millard S. Rosenblatt, local chairman. Address inquiries to: Dr. H. P. Saunders, 40 East Erie Street, Chicago 11, Illinois.

April

Sectional Meeting, Hotel Leamington, Minneapolis, Minnesota, April 11, 12, 13. Dr. Horace G. Scott, local chairman. Address inquiries to: Dr. H. P. Saunders, 40 East Erie Street, Chicago 11, Illinois.

Sectional Meeting, Kahler Hotel, Rochester, Minnesota, April 14. Dr. Edward Starr Judd, Jr., and Dr. Joseph H. Pratt, co-chairmen. Address inquiries to: Dr. H. P. Saunders, 40 East Erie Street, Chicago 11, Illinois.

October

Clinical Congress, San Francisco, California, October 27-November 1.

POSTGRADUATE COURSES ON DISEASES OF THE CHEST

The Council on Postgraduate Medical Education of the American College of Chest Physicians will present the following postgraduate courses this fall:

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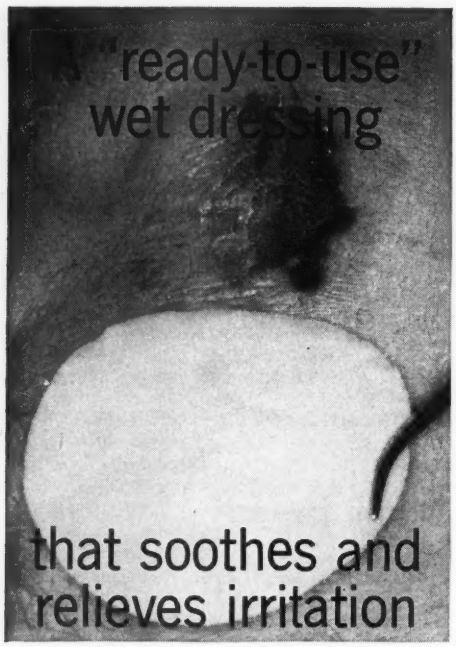
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The problems of the sources, effects and control of community air pollution will be treated in an intensive two-week course, "Air Pollution," offered by the New York University Post-Graduate Medical School in cooperation with the New York University College of Engineering from November 30 through December 11, 1959.

Radiological Health

The Department of Industrial Medicine of the New York University-Bellevue Medical Center Post-Graduate Medical School offers five courses in radiological health starting in October, 1959.

The courses are intended for persons already trained in one of the physical, engineering, biological or medical sciences who require a comprehensive introduction to the new techniques and methods associated with radiological hazard evaluation. The courses are as follows:

Introduction to Radiological Health.—Full time, October 12-23, 1959. For persons having responsibilities connected with the health and safety of personnel in installations using sources of ionizing radiation.

Radiological Health Laboratory.—Full time, October 26-November 6, 1959. A series of experiments designed to furnish a familiarity with the most important categories of nuclear detection apparatus and techniques of measurement.

Radiochemical Analysis.—A two-week intensive course, November 9-20, 1959, covering the techniques of radiochemistry and counting required for the determination of radioisotopes in biological and environmental samples.

Medical and Public Health Control of Ionizing Radiation.—Full time, March 7-18, 1960. Primary emphasis is on the biological effects of radiation and medical control programs. Specifically designed for public health officials, physicians, and others with biological interests.

Radiation Hygiene Measurements.—A four-week intensive course, April 18 through May 13, 1960, offering laboratory instruction in surveying, monitoring and sampling procedures for persons having some acquaintance with nuclear measurement principles.

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New York University-Bellevue Medical Center's Post-Graduate Medical School offers the following post-graduate courses:

(Continued on Page 1304)

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Patient M.S., 81, at the time of the first visit was in severe pain and very uncomfortable. Complained of swelling of wrists, legs and various joints; pain and stiffness in cervical area and lower spine; pain, swelling and limited motion in the fingers; slight ulnar deviation of the hand. M.S. demonstrates position necessary to put on his hat (motion was so restricted that he could not comb his hair).

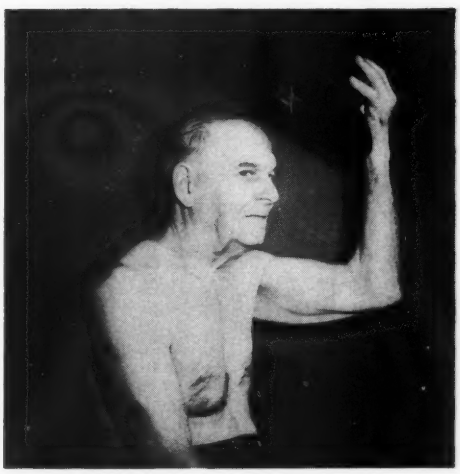
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(Continued from Page 1302)

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The Practical Fundamentals of Clinical Electrocardiographic Interpretation—Part-time, eighteen sessions, Wednesdays, 7 to 9 p.m., November 4, 1959 through March 16, 1960 (excluding December 23 and 30, 1959;

Electrocardiography.—Full-time, five-day course, Monday through Saturday (excluding Wednesday and Saturday afternoons) November 9-14, 1959.

For further information, write the Associate Dean, New York University Post-Graduate Medical School, 550 First Avenue, New York 16, New York.

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Minnesota Blue Shield

On July 17, 1959, a representative of the National Association of Blue Shield Plans appeared before the House Ways and Means Committee to present the following facts illustrating the efforts which have been made by the majority of Blue Shield Plans to develop programs of voluntary health care coverage for senior citizens.

At the present time, twenty-four of the sixty-five Blue Shield Plans in operation in the United States, representing one-third of the total United States Blue Shield membership, offer non-group coverage to those over sixty-five. In addition, there are four more plans, embracing 17 per cent of the total Blue Shield membership, with programs approved but not actually in effect. There are twenty-five Plans with 41 per cent of total Blue Shield membership that have programs in various stages of development. Thus, Blue Shield Plans which have enrolled 92 per cent of the 40,681,000 present Blue Shield subscribers in the United States, already have or are currently developing special programs for this segment of the population.

Not unlike many other Plans, Minnesota Blue Shield, since its inception in 1947, has provided non-group coverage for medical-surgical care rendered senior citizens, regardless of age, whose contracts were in effect on their sixty-fifth birthday. At the present time, approximately 60,000 persons of age sixty-five or over are enrolled under Minnesota Blue Shield. However, there are more than 200,000 additional Minnesotans over age sixty-five who are not presently enrolled with the Plan. To assure this group of the availability of Blue Shield coverage and culminated by the approval of the Minnesota State Medical Association at its meeting in May, Blue Shield developed a voluntary health care program for the senior citizens of Minnesota. It is anticipated that applications will be accepted on a trial basis during the month of October, 1959.

1959-1960

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JANUARY 21, 22
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In Cooperation with
Division of Maternal and Child Health
Nebraska State Health Department

FEBRUARY 24
DIABETES
In Cooperation with
The Nebraska Diabetes Association

FEBRUARY 25, 26
RENAL DISEASES

MARCH 24
PSYCHIATRY and NEUROLOGY

MARCH 31
OBSTETRICS
At Lincoln General Hospital
Lincoln, Nebraska

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In Memoriam

EDGAR W. BEDFORD

Dr. Edgar W. Bedford, Minneapolis physician and surgeon since 1920, died June 23, 1959, while vacationing in San Francisco. Doctor Bedford was seventy-two years old at the time of his death.

A native of Sheboygan, Wisconsin, he graduated from the University of Wisconsin and Rush Medical College in Chicago. Doctor Bedford was a veteran of World I.

Doctor Bedford was a member of the Hennepin County Medical Society, the Minnesota State Medical Association, and the American Medical Association.

He was on the staffs of Doctors Memorial and St. Barnabas Hospitals.

Survivors include his wife, Gladys; a son, Dr. Fred Bedford, Norwood, Colorado; two daughters, Mrs. Paul Sparso, Medford, Oregon, and Mrs. Martin Grady, Minneapolis, and six grandchildren.

CHARLES PERN ROBBINS

Dr. Charles Pern Robbins, Winona physician for more than sixty years, died July 15, 1959. Doctor Robbins, who established and operated the first x-ray department at the Winona General Hospital, served as county and school physician and was the first president of the Winona County Public Health Association. He was eighty-nine years of age at the time of his death.

Doctor Robbins was a native of Burlington, Iowa. He entered the Baptist College two years after graduating from Burlington High School in 1888. He graduated cum laude from Jefferson Medical College in Philadelphia. He began medical practice in Saginaw, Michigan, before becoming assistant surgeon in Los Angeles National Soldiers Home for one year. The following year, he took a four-month course in surgery at New York Post-Graduate Hospital. In 1896, he came to Winona, where he practiced medicine ten years and was on the staff of Winona General Hospital.

In 1906, he went to Europe to study under specialists. Doctor Robbins then made his decision to specialize in internal medicine and practiced in Winona for one year before going abroad to study.

In 1947, he was elected to an honorary fellowship in the American Medical Association. He also received a certificate of recognition for fifty-three years of service as an alumnus of Jefferson Medical College.

In 1940, he was made an honorary life member of the Minnesota State Medical Association, and in 1947, he was made an honorary life member of the Winona County Medical Society. He was an honorary member of the Winona General Hospital staff.

Doctor Robbins was a member of Winona Lodge 18, AF & AM, the Scottish Rite, the American Legion, the Arlington Club, the Winona County Medical Society, the Minnesota State Medical Association, and the American Medical Association.

Doctor Robbins is survived by his wife, Helen.

(Continued on Page 1310)



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Improvement and Release Following Prefrontal Lobotomy

The increased use of tranquilizing drugs has reduced the necessity of attempting to control some psychotic patients with the operation known as prefrontal lobotomy. All psychotic persons, however, do not respond favorably to medical treatment of this kind. The authors present a series of 38 male and 45 female patients operated upon between 1941 and 1956. Critical analysis of their data indicates that a significant number of these patients are improved and able to be released from institutional control following this type of surgery.

GORDON W. OLSON, Ph.D.
DONALD B. PETERSON, M.D.
Anoka, Minnesota

Dr. Olson is chief psychologist and Dr. Peterson is superintendent of the Anoka State Hospital.

THE surgical procedure known as prefrontal lobotomy, which severs fibers connecting the prefrontal area and deeper structures within the brain, was hailed some years ago as a beneficial procedure in various psychic conditions including obsessive compulsive neurosis, schizophrenia, and the patient with intractable pain. The common denominator of action seems to be an alteration of the patient's psychic reactions so that, although the basic obsessions, the frightening and disturbing delusions, or the intractable pain are apparently still present, the meaning and the appreciation of the disturbing element is diminished, and the patient is freed from his preoccupation with the disturbing factors. Through this procedure, many patients have been enabled to leave the psychiatric hospital and to take up useful lives. Since the advent of the tranquilizing drugs which

have had a marked influence on such conditions, the use of lobotomy has been markedly decreased and indeed in some quarters, may be said to be in disrepute. Nevertheless, the procedure is still utilized and indeed, its use will probably increase as the pool of patients who have not benefited from tranquilizers increases.

The degree of interest in this procedure varies directly with the physicians' degree of responsibility for the treatment of the psychotic.

Since the family physician is apt to be consulted by the next of kin who have been asked to consent to the surgery, it is believed that the subject matter of this paper is of general interest and contains useful information.

Although many studies have been published regarding the efficacy of prefrontal lobotomy, direct comparison among these studies is difficult because of geographical and individual differences in rationale for the surgery, diagnostic concepts, and manner of classifying and reporting the data. For this reason, this study concerned itself only with the more gross variables to assess local molar results for contribution to the general fund of information available on lobotomy.

Anoka State Hospital is a suburban 1100 bed psychiatric hospital, approximately sixty beds of which are located on the intensive treatment and admissions service. There is about 50 per cent monthly turnover on this service. In some cases the surgery was performed at other hospitals and the patient transferred to Anoka at a later date.

Method

The series contained thirty-eight males and forty-five female subjects operated upon between 1941 and 1956. The age range was twenty-two to sixty-six years and the mean was 42.34 years; length of hospitalization ranged from two months to thirty-one years with a mean of 6.95 years. The number of lobotomy operations performed per year in this sample increased steadily from a single operation the first year to sixteen operations during the last year. Forty-three (52 per cent) were operated upon between 1954 and 1956. In this sample, sixty-six patients (80 per cent) were diagnosed as schizophrenia, five as manic-depressive, ten as neurosis, one as chronic brain syndrome, and one as mentally deficient. The one mentally deficient patient had been transferred to Anoka from a state school for mental defectives two months before the operation. A severe behavior problem, he demonstrated considerable assaultive and destructive behavior while at Anoka. Although diagnosed as mental defective without psychosis, his behavior was such that others might well have made a diagnosis of psychosis with mental deficiency. There was no control group since an attempt to find patients who have been considered for lobotomy, but upon whom the operation was never performed for medical reasons or for lack of permission, resulted in gathering only a few acceptable cases.

In essence, the study concerned the relationships of five independent variables (age, length of hospitalization, diagnosis, rationale and sex) to two dependent variables (improvement and disposition). In addition it was possible to establish the number of behavioral incidents in which a portion of this sample was involved before and after lobotomy.

Definitions of terms used throughout this report are as follows:

Improvement refers to the physician's judgment as to whether the patient was in general more manageable and/or more comfortable than before the operation. The physician's rating was dichotomous, involving only the categories improved and unimproved.

Disposition refers to the location of the patient at the time of the study. The categories were: (1) still hospitalized; (2) transferred; (3) deceased; (4) discharged. Patients on provisional discharge were classified as discharged while those on brief visit were considered hospitalized. (In Minnesota, discharge becomes automatic after twelve months of provisional discharge unless extended for cause or unless the patient is readmitted.)

Length of Hospitalization (LH) refers to the number of months from the date of first admission to any Minnesota state hospital to the date of lobotomy. It includes time spent out of the hospital during unsuccessful attempts at provisional discharge.

Rationale refers to one author's opinion (G.W.O.) as to whether the lobotomy was intended primarily to alleviate severe distress or to reduce acting-out behavior. The opinion was based upon prelobotomy history and nursing notes; the

classifications employed were: (1) management; (2) management and comfort; (3) comfort.

Diagnosis was the formal determinate diagnosis listed for the patient in the medical records section of the hospital.

Age refers to the age of the patient at the time of surgery.

In the statistical analysis of the data, age and LH were treated as continuous data and the *t* test employed; the other variables were treated as frequency data and the X^2 test was used.

TABLE I. PHYSICIANS' RATINGS OF IMPROVEMENT FOLLOWING LOBOTOMY

Rating	Male		Female		Both	
	No.	%	No.	%	No.	%
Improved	25	66	37	82	62	75
Unimproved	13	34	8	18	21	25
Total	38	100	45	100	83	100

Results

Improvement.—Improvement was found to be grossly related to three variables: disposition, sex and LH. There was a significant relationship ($p < .01$) between the rating of improvement and release from the hospital following lobotomy. Only one unimproved case was subsequently discharged from the hospital, and this was for deportation to another state, presumably for further care. There was a marked tendency ($p < .10$) for females to have rated as improved more often than males (Table I). When the sexes were matched for LH, the difference in proportions of improved and unimproved was more pronounced ($p < .05$).

The average length of hospitalization prior to surgery was 5.62 years for the Improved group and 9.39 years for the Unimproved group ($p < .05$).

Disposition.—Disposition was found to be significantly related to four variables: improvement (as discussed above), LH, rationale, and diagnosis. Of the original eighty-three subjects, twenty-six had been discharged, forty-nine were still hospitalized, eight had been transferred to other hospitals. There were no deaths. Since the post-transfer status of eight patients was unknown, the following results pertain only to seventy-five patients.

The average age for the Discharge group was 44.31 years compared with 42.21 years for the Still Hospitalized group. The average LH prior to surgery was 2.06 years for the Discharged group and 8.73 years for the Still Hospitalized group ($p < .001$). The relationship of LH to disposition and to improvement is shown in Table II.

TABLE II. RELATIONSHIPS OF POST-LOBOTOMY DISCHARGE RATE AND POST-LOBOTOMY IMPROVEMENT TO LENGTH OF HOSPITALIZATION PRIOR TO LOBOTOMY

Rating	Years Hospitalization Prior to Lobotomy						
	½	1	2	3	5	10	10
Improved (%)	100	71	82	75	88	73	58
Discharged (%)	80	67	36	50	38	11	0

The disposition was significantly different for the two rationale employed ($p < .001$), when excluding the middle category of "management and comfort." At the time of the file search, two of thirty-one patients lobotomized for "management" reasons were on discharge compared with sixteen out of twenty-four patients operated upon for "comfort" reasons. When the "comfort" and "management" groups were matched for LH and diagnosis, the difference remained significant ($p < .05$) with two out of eleven of the "management" group and ten out of fourteen of the "comfort" group in the discharge category.

Evaluation of the effect of specific diagnosis upon disposition was difficult since so few subjects fell in each of the nonschizophrenic groups. There was a significant difference ($p < .01$) for disposition of psychotics and neurotics, with eighteen out of sixty-five psychotics having been released compared with eight out of ten neurotics.

Untoward Incidents.—In-hospital observations of behavior were available on nineteen subjects covering a period of one year prior to surgery and two years following surgery. Other subjects had transferred in less than one year before surgery or transferred out or discharged before two years postsurgery. The total number of untoward incidents for these nineteen subjects was fifty-seven for the twelve months preceding surgery, twenty-six for the first year following surgery and twenty-eight for the second year after lobotomy. From the preoperative period to the *second* postoperative year, twelve subjects showed a decrease in the number of incidents, three subjects showed the same number of incidents as before lobotomy, and four subjects manifested an increase (sign test $p < .04$).

Discussion

One of the more significant findings was the clear cut relationship of length of hospitalization and subsequent discharge. This finding corroborates several other studies[1,2,3] but is not interpreted as evidence for the lobotomy as a procedure to be employed early in the patient's illness. In the absence of a control group, it is uncertain to what extent the lobotomy contributed to the greater number of remissions in the short-term patients. Patients hospitalized for longer periods of time are those likely to have proven more refractory to longer courses and more varied forms of therapy than the short-term patient. Perhaps some portion of the short-term patients would have responded to sustained or repeated trials of another therapy. In short, the greater discharge rate among the short-term patients probably reflects in part a greater amenability to treatment *in general* than that found in the long-term patients.*

Further, the criterion of discharge from the hospital is complex and involves far more than the degree of "health" of the patient. It is generally felt that the amount of interest and understanding of the potential environment is of considerable importance in the determination of the patient's discharge and adjustment, and although these things may have been initially equal for the short and long term hospitalization groups, it is likely that family and associates retain more interest in the patient hospitalized one or two months or years than in the patient hospitalized twelve to fifteen years or more. In addition, it is plausible that some patients became "adapted" to the hospital after a decade of hospitalization, and few feel that the lobotomy restores social motivation; indeed, many long term patients actively resist discharge.

It was shown that the "management" type of patient in this sample had a longer LH and was less likely to be discharged following lobotomy than was the "comfort" type of patient. Beyond the obvious inference that the surgery may have been less effective in reducing acting-out behavior than in relieving subjective distress, sociological and administrative factors undoubtedly also operated. These involve the possibilities that the community may have offered something less than a welcome to the formerly assaultive individual, and the hospital may have been less willing to proffer a discharge to patients with such histories.

It was found that females received more ratings of "improved" than did the males. We have no clear cut interpretation of this but we do note that this finding is consistent with several other studies of lobotomy follow-up.[3,4]

*We have noted that a few obsessive-compulsive patients not included in this series have responded well to lobotomy in spite of very long periods of prior hospitalization. It may be that the LH factor is of less prognostic importance in this disorder specifically, or in the neuroses in general, than for the psychoses.

Summary

This study involved an analysis of the relationships of five independent variables (age, sex, length of hospitalization, diagnosis, and rationale) to lobotomy outcome, where outcome was defined by the physician's rating of improvement and by hospital release. The effect of surgery upon the number of behavioral upsets over a period of one year pre-lobotomy and two years post-lobotomy was also studied. From the results we concluded the following:

1. Length of hospitalization prior to lobotomy was closely and inversely related to outcome, both in terms of improvement and release, but was more closely related to the latter.
2. Specific diagnosis was not predictive of either improvement or release, but neurotics as a group had a significantly greater release rate than did psychotics as a group.
3. Assaultive and destructive behavior was reduced following lobotomy and this reduction was sustained by the group for at least two years.
4. Patients who demonstrated assaultive or destructive behavior pre-lobotomy were less likely to be released after lobotomy than were those who demonstrated self-punishing behavior, but the groups were equally likely to be rated as improved.
5. Females were more likely than males to be rated as improved following the surgery, but they were no more likely to be released from the hospital.

References

1. Freeman, J. G., and Lucero, R. J.: F-L Fergus Falls lobotomy scale. A.M.A. Arch. Neurol. Psychiat., 76:30-33, 1956.
2. Freeman, W.: Level of achievement after lobotomy. Am. J. Psychiat., 110:269-276, 1953.
3. Jackson, C. L., and Jaco, E. G.: Some prognostic factors in 538 transorbital lobotomy cases. Am. J. Psychiat., 111:353-357, 1954.
4. Kral, V. A., and Elvidge, A. R.: Four years experience with prefrontal lobotomy. Am. J. Psychiat., 112:375-381, 1955.

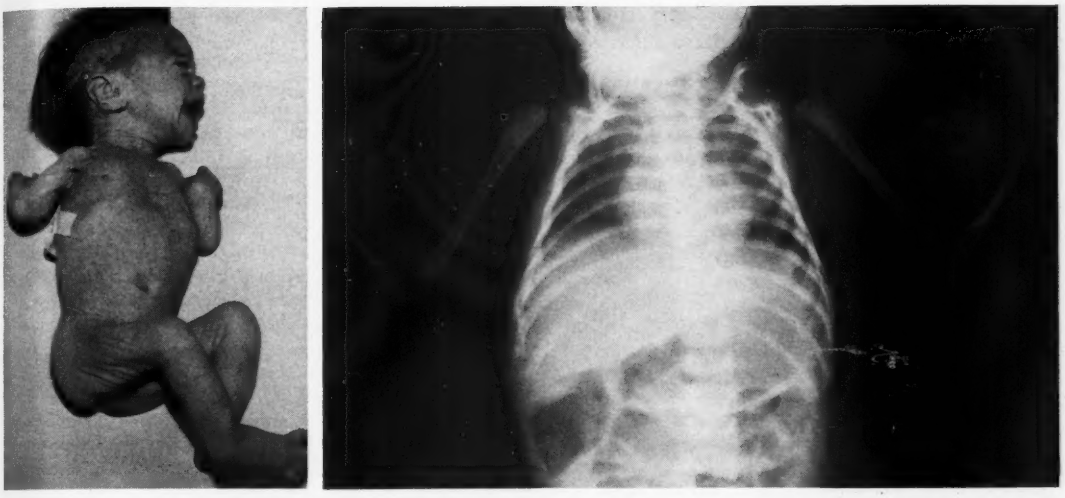


Fig. 1 (Case 1) *(left)* Note deformity of the arms. *(Right)* Roentgenographic appearance. Note absence of the radii.

Congenital Hypoplastic Anemia Associated with Multiple Congenital Anomalies (Fanconi's Syndrome): Report of Two Cases

When confronted by a child with congenital anemia associated with multiple congenital anomalies, such as microcephaly, abnormal cutaneous pigmentation, retarded growth, skeletal deformities, strabismus and hyperactive reflexes, the physician should recognize the probability of Fanconi's syndrome. This paper presents two such cases.

REZA GHARIB, M.D.
STEPHEN D. MILLS, M.D.
JOSEPH M. KIELY, M.D.

Rochester, Minnesota

From the Mayo Clinic and Mayo Foundation, part of the Graduate School of the University of Minnesota, Rochester, Minnesota.

CONGENITAL hypoplastic or aplastic anemia associated with multiple congenital abnormalities during infancy and childhood is uncommon. In reviewing the literature, we were able to find only forty-one cases of such a combination.

In 1927, Fanconi[1] first reported this combination. He described three brothers, aged five, six and seven years, respectively, each of whom had anemia, thrombocytopenia, increased pigmentation of the skin, microcephaly without mental impairment, retarded growth, testicular hypoplasia, exaggerated deep tendon reflexes and convergent strabismus. Necropsy revealed hypoplasia of all elements of the bone marrow. A moderate number of "megaloblasts" were present in the peripheral blood of one patient. Fanconi regarded this syndrome as a "familial pernicious-like anemia."

Cases of Fanconi's syndrome occurring both in

families[2-7] and sporadically[8-11] have been reported since the first description. We recently encountered two patients with this disorder.

Report of Cases

Case 1.—A six-week-old white girl was brought to the Mayo Clinic because of rectal bleeding of four and a half weeks' duration. She was the product of a full-term gestation and normal delivery. Her weight at birth was 6 pounds and 11 ounces (3 kg.). Except for bilateral deformity of the forearms, nothing unusual was noted at birth. The postnatal period was uneventful until she was ten days of age, when rectal bleeding commenced.

Both parents were living and well; the patient was their only child. There was no history of a similar condition in the family.

Examination at the clinic revealed a poorly developed, thin baby with pronounced pallor and poor cutaneous turgor. Her rectal temperature was 100° F., and her weight was slightly more than 5 pounds (2360 gm.). The circumference of the head was 14 inches (36 cm.) and that of the thorax was 12 inches (30 cm.). Multiple ecchymoses of both elbows and severe radial deviation of the wrists were noted (Fig. 1, left). Both radii were absent. Each hand contained five digits. The liver and spleen were not palpable, nor was lymphadenopathy noted.

Laboratory Data.—Results of urinalysis were normal. The initial values for hemoglobin and erythocytes were 4.9 gm. per 100 ml. of blood and 1,680,000 cells per cubic millimeter, respectively. The leukocytes, at the time the patient was admitted, numbered 32,500, with 57 per cent lymphocytes, 8 per cent monocytes, 29 per cent neutrophils, 4 per cent eosinophils and 2 per cent basophils; there were three normoblasts per 100 leukocytes. Reticulocytes ranged from 2.8 to 12.6 per cent of the erythrocytes. The platelet counts ranged from 25,000 to 82,000 (the normal value in our laboratory is 100,000 to 250,000). The bleeding time was seven and a half minutes; the Quick prothrombin time was 18 seconds (normal in our laboratory is 17 to 18 seconds). A smear of the blood showed a leukemoid reaction with immaturity to the stem cell, as well as anisocytosis, polychromasia and basophilic stippling of the erythrocytes, and large atypical platlets. The anemia was considered to be normocytic and normochromic in type.

Smears of bone marrow from the tibia disclosed pronounced suppression of erythropoiesis, with only a rare late normoblast seen (see Table I). Myelopoiesis was active and was shifted to the left. Fixed sections of marrow were somewhat hypercellular; normoblasts and megakaryocytes were not identified.

Roentgenograms showed congenital absence of the radius of each forearm, with a congenital deformity at the wrists (Fig. 1, right). Flexion deformities of the fingers were noted, and the anterior aspect of the ulna showed some cortical thickening bilaterally.

Course.—The patient received a total of 480 ml. of blood in multiple transfusions. She continued to pass bloody stools at intervals during her stay in the hospital, and ecchymosis occurred at the sites of venipuncture.

Administration of ACTH (acthar gel) in a dose of 150 mg. per square meter of body surface per day was begun on the twelfth day of hospitalization and was continued for 14 days until she died, apparently in peripheral shock. The use of ACTH did not appear to alter either the clinical course or the blood picture.

Pathologic Findings.—Necropsy disclosed a hemorrhagic ulcer of the ascending colon, measuring 3.5 by 3 cm. Zones of petechial hemorrhage were present throughout the small intestine and in the hepatic flexure of the ascending colon. The spleen and liver were normal. The spleen contained some areas of myeloid metaplasia but, considering the age of the patient, these were not considered unusual. Fixed sections of vertebral bone marrow showed active left-shifted granulopoiesis but little evidence of erythropoiesis; only a rare megakaryocyte was noted.

Case 2.—A 13-month-old white boy was admitted to the hospital because of anemia since birth. The antenatal, natal and postnatal course was uneventful. At birth, it was noted that the baby was pale and had a small head. He smiled at two months of age, grasped objects at five months, sat up alone at eight to nine months and pulled himself up to a standing position at ten months of age.

The patient was the only child of his parents, and the family history was not remarkable.

At two months of age, he had been hospitalized for blood transfusions because of severe anemia. The anemia had persisted, requiring periodic transfusions. No bleeding tendency was noted.

Examination revealed a pale, microcephalic, alert baby. The external ears were deformed and low on both sides; they protruded laterally and rolled on themselves. His rectal temperature was 100° F. He weighed 15¼ pounds (6.9 kg.) and was 27½ inches (69 cm.) tall. The blood pressure was 110 mm. of mercury systolic and 53 mm. diastolic. The pulse rate was 120 beats per minute. The circumference of his head was 14 inches (36 cm.) and that of the thorax was 16 inches (41 cm.). His anterior fontanel was closed. The liver and spleen were not palpably enlarged, and no lymphadenopathy was noted. The deep tendon reflexes were hyperactive. Clubfoot was present on the left. Cutaneous pigmentation was absent. The testes were palpable in the inguinal canals.

Laboratory Data.—Urinalysis showed nothing abnormal. The value for hemoglobin was 3.8 gm., and the erythrocytes numbered 1,240,000. The leukocyte count was 6,700, with 64 per cent lymphocytes, 2 per cent monocytes and 34 per cent neutrophils. The reticulocyte count was 0.3 per cent. Platelets numbered 120,000. The blood was group A and Rh positive. The Coombs test gave normal results. Direct-reacting serum bilirubin was absent; the indirect-reacting component measured 0.7 mg. per 100 ml. Smears of peripheral blood revealed

normocytic and slightly hypochromic erythrocytes; polychromasia was absent.

Volumetric study of the bone marrow revealed the following percentages: 1 per cent fat, 85 per cent plasma, 2 per cent myeloid-erythroid cells, 12 per cent erythrocytes. Fixed sections of bone marrow were hypocellular, with practically no normoblasts present (see Table I).

Roentgenograms of the head revealed a small calvarium as compared to the size of the facial bones; the suture lines were not closed. Roentgenograms of the thorax were normal.

Subsequent information obtained from his home physician indicated the patient was still alive at the age of 5 years. He has required blood transfusions at approximately six-week intervals.

TABLE I. DIFFERENTIAL CELL COUNTS OF BONE MARROW IN TWO CASES OF FANCONI'S SYNDROME

Type of Cell	Per Cent Incidence	
	Case 1	Case 2
Neutrophils	21.8	23.0
Lymphocytes	7.0	41.4
Monocytes	1.6	3.6
Eosinophils	9.6	2.6
Basophils	0.4	0.0
Metamyelocytes	12.2	8.6
Late myelocytes	16.2	9.2
Early myelocytes	14.6	4.4
Progranulocytes	7.2	2.4
Blast cells	2.8	2.2
Immature lymphocytes	0.0	1.4
Pronormoblasts	0.6	0.2
Basophilic normoblasts	1.4	0.2
Polychromatic normoblasts	3.6	0.6
Orthochromatic normoblasts	1.0	0.2

Comment

Chappell[12] reported a case of pancytopenia with hypoplasia of the bone marrow and multiple congenital anomalies in a boy six weeks of age; the presenting symptom in this case was not pallor or hemorrhage but transposition of the external genitalia, for which plastic surgery was requested. The patient was said to appear generally healthy, but he had multiple skeletal abnormalities. Baumann's[13] patient, who died at the age of five years, was noted to have pallor at four months and purpura at thirteen months of age.

In Fanconi's syndrome, multiple genetic mechanisms apparently are altered simultaneously so that developmental disturbances occur in the skeletal system (various bony defects), the nervous system (hyperactive deep tendon reflexes, paralysis of the vocal cord,[14] gliosis of the cortex),[6] the eye (strabismus, nystagmus),[5] the urinary system (absent kidney), the genitalia (testicular hypoplasia, transposition of the external genitalia)[12] and the hematopoietic system (hypoplasia or aplasia of the bone marrow). Disturbances in bone marrow, therefore, are merely part of an array of multiple congenital defects.

This syndrome appears to be more common in males than in females. Most instances of Fanconi's syndrome show a familial incidence, although as already noted, sporadic cases also have been reported, including our two patients. Sporadic instances may be due to spontaneous mutation of genes. Each of our patients was an only child, and the absence of siblings leaves open to question whether the syndrome will repeat itself in these families.

The congenital abnormalities occurring in this syndrome are protein. Dawson[15] summarized the various anomalies associated with this syndrome in 30 cases. Among these abnormalities, the commonest finding is patchy brown pigmentation of the skin; Fanconi ascribed this to deposition of melanin, and this finding has been confirmed by others.[11,13]

Of course, no definite measurement could be made of our first patient's mental status, but the circumference of her head was much smaller than normal, as was her stature. Our second patient also had extremely small head circumference and stature.

To the best of our knowledge, Case 1 represents one of the youngest patients in whom a definitive diagnosis of this syndrome has been established. The hematologic findings in this patient included severe anemia with thrombocytopenia. The leukocyte counts were increased, perhaps in response to hemorrhage. It is difficult to reconcile the reticulocytosis noted in this patient with the almost complete absence of normoblasts in the bone marrow, although the presence of reticulocytosis in certain cases of hypoplastic anemia, particularly those of congenital type, has been noted.[16]

The hematologic derangement in Case 2 was confined to the erythrocytes, with erythropoiesis in the marrow being greatly depressed; the myeloid line and the megakaryocytes were normal. Thus, this case combines features of both Fanconi's syndrome and pure erythrocytic aplasia (erythrogenesis imperfecta).

Although three of the original patients of Fanconi and several other patients had macrocytic anemia, this is not a constant feature. The anemia is usually normocytic or slightly macrocytic. The bone marrow in this syndrome is described variously as fatty, hypocellular, normally cellular and even hypercellular.

The cause of Fanconi's syndrome is not well known. It is certainly not related to pernicious anemia, as Fanconi originally suggested. Various etiologic factors have been postulated, such as maternal illness during the first trimester of pregnancy,[17] a disturbance of tryptophan metabolism[18] with its by-product of anthranilic acid, and a deficiency of peroxidase in the nuclei of erythroblasts.[19]

This disease is usually fatal. The course of the disease is marked by severe bleeding or progressive anemia or both. Death usually results from hemorrhage into the brain or gastrointestinal tract.

The treatment of patients who have Fanconi's syndrome has been mainly supportive. Periodic blood transfusions may help temporarily; however, if the bone marrow is severely hypoplastic, therapy is usually ineffective. Information concerning the use of ACTH and adrenocortical steroids in this disease is scanty. Remarkable results have not occurred,[11] including the experience with our first patient. Since the original report by Davis and Shumway,[20] transplantation of bone marrow has become increasingly promising. This technique may have future application in the treatment of patients who have Fanconi's syndrome.

Summary

Two cases of Fanconi's syndrome studied at the Mayo Clinic are reviewed. In the first case, pronounced hypoplasia of the marrow normoblasts and megakaryocytes was noted. The diagnosis was established when the patient was six weeks old. In the second case, severe hypoplasia of the marrow normoblasts was the main hematologic abnormality. The second case combined features of both Fanconi's syndrome and pure erythrocytic aplasia (erythrogenesis imperfecta).

Acknowledgment

We wish to express our gratitude to our colleague, Dr. E. C. Burke, who made the second case available to us.

References

1. Fanconi, G.: Familiäre infantile perniziosaartige anämie (perniziöses Blutbild und Konstitution). Jahrb. f. Kinderh., 117:257-280, 1927.
2. Emile-Weil, P.: Myélose aplasique infantile familiale avec malformations et troubles endocriniens. Contribution à l'étude du syndrome de Fanconi. Sang, 12:369-389, 1938.
3. Hjorth, P.: Two cases of constitutional anemia in children. Nord. med., 7:1313-1317 (Aug. 3) 1940.
4. Dacie, J. V., and Gilpin, A.: Refractory anaemia (Fanconi type): Its incidence in three members of one family, within one case a relationship to chronic haemolytic anaemia with nocturnal haemoglobinuria (Marchiafava-Micheli Disease or "Nocturnal Haemoglobinuria"). Arch. Dis. Childhood, 19:155-162 (Dec.) 1944.
5. Reinhold, J. D. L., Neumark, E., Lightwood, R., and Carter, C. O.: Familial hypoplastic anemia with congenital abnormalities (Fanconi's Syndrome). Blood, 7:915-926. 1952.
6. Levy, W.: Aplastic anemia in siblings with multiple congenital anomalies (Fanconi Type). J. Pediat., 40:24-41 (Jan.) 1952.
7. Wintrobe, M. M.: Clinical Hematology, p. 573, 4th ed. Philadelphia: Lea & Febiger, 1956.
8. Estren, S., Suess, J. F., and Dameshek, W.: Congenital hypoplastic anemia associated with multiple developmental defects (Fanconi Syndrome): Report of a case. Blood, 2:85-93 (Jan.) 1947.
9. Beautyman, W.: Case of Fanconi's anaemia. Arch. Dis. Childhood, 26:238-240 (June) 1951.
10. Silver, H. K., Blair, W. C., and Kempe, C. H.: Fanconi Syndrome: Multiple congenital anomalies with hypoplastic anemia. A.M.A. J. Dis. Child., 83:14-25 (Jan.) 1952.
11. Kessel, I., and Cohen, H.: Case of Fanconi's anaemia. South African M. J., 27:883-884 (Oct. 3) 1953.
12. Chappell, B. S.: Transposition of external genitalia in a case with Fanconi type deformity. Tr. Southeast. Sect. Am. Urol. A., 21:7-10, 1957.
13. Baumann, T.: Konstitutionelle Panmyelophthise mit multiplen ábartungen (Fanconi-Syndrom). Ann. Paediat., 177:65-65 (Aug.); 142-174 (Sept.) 1951.
14. Kunz, H. W.: Hypoplastic anemia with multiple congenital defects (Fanconi Syndrome). Pediatrics, 10:286-291 (Sept.) 1952.
15. Dawson, J. P.: Congenital pancytopenia associated with multiple congenital anomalies (Fanconi Type): Review of literature and report of 20-year-old female with 10-year follow-up and apparently good response to splenectomy. Pediatrics, 15:325-333 (Mar.) 1955.
16. Estren, S., and Dameshek, W.: Familial hypoplastic anemia of childhood: report of eight cases in two families with beneficial effect of splenectomy in one case. Am. J. Dis. Child., 73:671-687 (June) 1947.
17. Miller, H. C., Clifford, S. H., Smith, C. A., Warkany, Josef, Wilson, J. L., and Yannet, Herman: Special report from the committee for the study of congenital malformations of the American Academy of Pediatrics: Study of the relation of congenital malformations to material rubella and other infections: Preliminary report. Pediatrics, 3:259-270 (Feb.) 1949.
18. Altman, K. I., and Miller, G.: Disturbance of tryptophan metabolism in congenital hypoplastic anaemia. Nature, London, 172:868 (Nov. 7) 1953.
19. Higashi, O., Koseki, E., and Higuchi, M.: Case of Fanconi's Syndrome with study of peroxidase activity of erythron. Arch. Dis. Childhood, 28:359-362 (Oct.) 1953.
20. Davis, P. L., and Shumway, Margaret H.: Bone marrow transplants: With anamnestic transfusions in the bone marrow deficiency states. M. Times, 86:141-145 (Feb.) 1958.

Avian Tuberculosis

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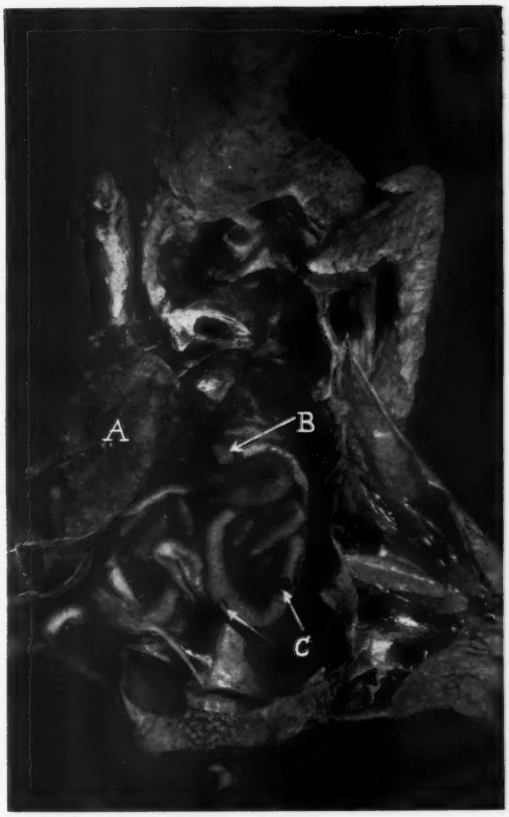


Fig. 1. Tuberculous lesions in the internal organs of a chicken from a farm flock. This bird had reacted to the tuberculin test. There are multiple lesions in the liver (A) and a large one in the spleen (B). Both organs are enlarged. Tuberculous nodules are seen on the intestine (C). (Courtesy of Dr. W. H. Feldman.)

ACID-FAST bacilli that cause tuberculosis in various species may be grouped into three categories depending on their primary hosts: (1) mammalian tubercle bacilli; (2) so-called cold-blooded tubercle bacilli, the cause of tuberculosis in reptiles and fish only; (3) avian tubercle bacilli. Of the mammalian group, the vole bacillus, *Mycobacterium microti,* causes tuberculosis in rodents only. The bovine type, *Myco. bovis,* and the human type, *Myco. tuberculosis,* may infect a number of wild and domestic animals. Except for infection in parrots due to human tubercle bacilli, the mammalian types are restricted to animals.

The avian tubercle bacillus, *Myco. avium,* is of particular interest because it is capable of causing disease in a variety of animals as well as being the principal cause of tuberculosis in avian species. Table I lists a number of common domestic and wild animals and birds that are known to be susceptible to infection with avian tubercle bacilli. In addition to those listed, avian tuberculosis has been found in many kinds of exotic birds in zoological gardens. Avian tubercle bacilli have been isolated from marsupials and from deer. Although a few cases of infection with avian tubercle bacilli have been found in man, the rarity suggests that man is relatively nonsusceptible.

Incidence of Tuberculosis in Chickens

Infection with *Myco. avium* in chickens is common in many parts of the world. In the United States, the extent of tuberculosis in poultry varies. It is almost negligible in the Southeastern states but is quite prevalent in the rural areas of the north central states. In farm flocks of old hens, that is, two years old and older, the infection rate may be 10 to 25 per cent.[2] Most of the tuberculosis in swine in this country is of avian origin. There is a greater incidence of tuberculosis in swine in the north central states than elsewhere in the United States.[3]

TABLE I. PATHOGENICITY OF AVIAN TUBERCLE BACILLI FOR VARIOUS SPECIES*

Birds	Susceptibility	Animals	Susceptibility
Chicken	Marked	Rabbit	Marked
Pheasant	Marked	Swine	Moderate
Turkey	Marked	Mink	Moderate
Parrot	Moderate	Sheep	Moderate
Duck	Moderate	Cow	Slight
Goose	Moderate	Mouse	Slight
Pigeon	Moderate	Rat	Slight
Crow	Moderate	Guinea pig	Slight
Sparrow	Moderate	Dog	Not susceptible
Canary	Moderate	Cat	Not susceptible

*Taken in part from Feldman.[1]

Morphologic and Cultural Characteristics of Mycobacterium avium

Avian tubercle bacilli cannot be distinguished from other acid-fast bacteria on the basis of morphology. The bacilli are slender rods measuring up to 3 microns in length. They may be beaded and slightly curved. They fail to form cords in liquid medium. They grow well at 37° C. on the various media used for tubercle bacilli. Growth appears in one to two weeks. Single colonies are round, elevated, smooth and moist. The growth has a slightly buff tinge of color which becomes more pronounced with age. The smooth glistening growth of avian tubercle bacilli is in contrast to the dry crumbly growth of human or bovine types. Avian tubercle bacilli are relatively resistant *in vitro* to isoniazid, para-aminosalicylic acid and streptomycin. They do not form niacin.

Identification of Mycobacterium avium

The morphologic and cultural characteristics of avian tubercle bacilli are not sufficient for identification. At present it is not known whether these bacilli have any characteristic metaboiic processes that are detectable by *in vitro* procedures. The differentiation from other acid-fast microorganisms must be based on the ability to cause fatal or extensive disease in chickens and rabbits and on the failure to produce progressive disease in guinea pigs. For this purpose, rabbits and chickens are infected intravenously with approximately 0.01 mg. of microorganisms suspended in 1.0 ml. of sterile water, and guinea pigs are given a similar amount subcutaneously. Chickens to be used for pathogenicity tests must be obtained from a source known to be free from avian tuberculosis. The chickens and rabbits must have been tested with avian tuberculin and have reacted negatively prior to infection.

Avian tubercle bacilli in an amount of 0.01 mg. will cause death of the rabbits and chickens usually in three to five weeks. If the animals survive for ninety days, they are killed and examined. The lesions are those of an acute process, particularly enlargement of the spleen and liver. Smears of these organs have innumerable acid-fast microorganisms. In addition to enlargement and infarction of the spleen and liver, the rabbits may have multiple tubercles on the peritoneum. In the chickens, the internal organs are extensively involved with multiple tubercles on the mesentery and in the femoral marrow. Guinea pigs have no involvement of the internal organs but there may be a persistent abscess at the site of injection. Table II shows the relative virulence of avian, human and bovine tubercle bacilli for rabbits, guinea pigs and chickens.

TABLE II. DIFFERENTIATION OF TUBERCLE BACILLI BASED ON RELATIVE PATHOGENICITY FOR LABORATORY ANIMALS

Strain	Pathogenicity		
	Rabbit	Guinea Pig	Chicken
Avian	++++	0	++++
Human	+	+++	0
Bovine	+++	++++	0

++++=Extensive involvement of internal organs; +++=moderate involvement; +=slight involvement; and 0=no involvement.

Lesions of Avian Tuberculosis in Chickens

The naturally occurring infection is usually alimentary in origin. Lesions are most frequently observed in the liver, spleen and intestinal tract although any organ may become involved (Fig. 1). Grossly, there are varying numbers of grayish nodules which range in size from pinpoint foci to irregular masses several centimeters in diameter. Caseation is common. Stained smears of the lesions reveal innumerable acid-fast bacilli. The histopathologic picture is that of a granulomatous process with central necrosis surrounded by a zone of epithelioid cells and giant cells. The lesions vary in extent from single foci to conglomerate processes with extensive caseation. Calcification is rare. Many acid-fast bacilli are seen in appropriately stained sections.

Tuberculin Test

For routine testing of chickens, avian tuberculin is injected intradermally in the wattle. A positive reaction is seen in forty-eight hours as an edematous enlargement of the wattle (Fig. 2). There

is some cross reaction between avian and mammalian tuberculins, which is an important consideration when testing animals that may be infected with bovine, human or avian tubercle bacilli. In swine, for example, it has been recommended that two simultaneous tuberculin tests be made using avian and mammalian tuberculin. Comparison of the severity of reaction may indicate the type of infection since there is usually a greater response to the homologous tuberculin.[3] Cattle infected with avian tubercle bacilli may react to the routine tuberculin test in which mammalian tuberculin is used. Another instance of cross reaction is the sensitization to avian tuberculin that develops in cattle with Johne's disease, which is caused by *Myco. paratuberculosis*. Practical use of this fact is made in the diagnosis of Johne's disease by employing avian tuberculin instead of the homologous product, johnin.



Fig. 2. Positive tuberculin reaction. This chicken was injected intramuscularly with 0.1 mg. of avian tubercle bacilli three weeks before the test. Approximately 0.1 ml. of avian tuberculin was injected intradermally in the right wattle and a similar amount of mammalian tuberculin, 1:100 dilution of old tuberculin, was given in the left wattle. The photograph, made forty-eight hours after injection of tuberculin, shows marked swelling of the right wattle in contrast to the left wattle which was only slightly edematous.

In man, a number of studies have been made in tuberculous patients to compare sensitivity to avian and mammalian tuberculin. An example is a study of 100 patients with pulmonary tuberculosis in which different dilutions of both tuberculins were used. With dilutions of 1:10,000 of old tuberculin (O.T.), 87 per cent reacted to the mammalian tuberculin and only 11 per cent reacted to the avian. However, when dilutions of 1:100 of O.T. were used, the mammalian tuberculin elicited reaction in 97 per cent and the avian in 93 per cent.[4] In a study in India,[5] about 3000 persons were tested with mammalian and avian tuberculin in amounts of 1, 10 and 100 tuberculin units (T.U.). If the area of the reaction did not exceed 6 mm. in diameter, the next higher dose was used. It was found that more than half of those reacting to 1 T.U. of mammalian failed to react to 1 T.U. of avian tuberculin. However, a high proportion of individuals reacting only to 100 T.U. of mammalian also reacted to 10 or more T.U. of avian tuberculin. Only a few reactors to 100 T.U. of avian gave any reaction to lower doses of mammalian tuberculin. The results were interpreted as suggesting two different sensitizing agents, one of which was the human tubercle bacillus which gave the greatest sensitivity to homologous tuberculin at lower doses, and the other of which caused sensitization to both tuberculins only at the higher amounts. Whether or not this agent was an avian tubercle bacillus was not determined. However, it was considered quite likely that the reactions to only 100 T.U. of mammalian tuberculin were actually cross reactions with the same agent that caused the sensitivity to avian tuberculin. Similar results have been obtained in America[6] and in South Africa[7] with avian and mammalian tuberculins. Several reviews of the literature lead to the conclusion that in man a positive reaction to avian tuberculin does not necessarily indicate infection with avian tubercle bacilli.[1,8]

Avian Tuberculosis in Man

It is apparent that man has a high resistance to infection with *Myco. avium*. The widespread distribution of tuberculosis in chickens, and the common occurrence of avian tuberculosis in swine, provide ample opportunity for transmission of the disease to man. However, there are few adequate records of the microorganism's having been isolated from human patients. In a review published in 1953,[8] only 39 cases were recorded in which the diagnosis of avian tuberculosis was acceptable.

In the United States there are four cases in which *Myco. avium* has been isolated by culture and identified by animal-pathogenicity studies. In

each instance, the acid-fast bacilli were given special interest because on original isolation they did not resemble either human or bovine tubercle bacilli. Instead, the colonies were smooth, rounded and slightly buff-colored, which is typical of avian tubercle bacilli. They were identified by demonstrating that the cultures in question were capable of producing progressive tuberculous disease in rabbits and chickens but not in guinea pigs. Briefly, these four cases are as follows.

Report of Cases

*Case 1**.—A 22-month-old child with diffuse infiltration of the right upper pulmonary lobe had acid-fast microorganisms in bronchial washings. One culture of gastric washings developed colonies that proved to be those of avian tubercle bacilli. The patient had a more pronounced reaction to avian than to mammalian tuberculin. She remained free of symptoms during nine months of hospital care, with gradual clearing of the infiltrate. The child had lived on a farm in Minnesota where 50 per cent of 400 chickens were found to react to avian tuberculin.

*Case 2***.—A 59-year-old man with cor pulmonale had a history compatible with silicosis. He had been a tool grinder in a rural town in Ohio. Roentgenograms revealed extensive bilateral pulmonary fibrosis. Acid-fast bacilli in pure culture identified as avian tubercle bacilli were isolated from three cultures of sputum and one of gastric washings. Sections of lung had fibrosis with birefringent crystals. One area of fibrosis had a small focus of necrosis with acid-fast bacilli.

Case 3†.—A 64-year-old granite worker, a lifelong resident of Minnesota, gave a history of exposure to silica and also had roentgenographic evidence of pulmonary fibrosis resembling silicosis. Repeated cultures of gastric washings had colonies identified as avian tubercle bacilli. This patient had a pronounced reaction to avian as well as to mammalian tuberculin. His serum agglutinated antigens from his own culture as well as from cultures of other avian tubercle bacilli.

Case 4.—A 57-year-old farm woman from Iowa had a fluctuating swelling of the right index finger from which tissue was excised. A pathologic diagnosis of tuberculous tenosynovitis was made. Avian tubercle bacilli were isolated by direct culture of the granulomatous tissue. Guinea pigs inoculated with a suspension of tissue failed to have any grossly visible lesions in eight weeks. Treatment with isoniazid and para-aminosalicylic acid was given for eight weeks but was discontinued when the acid-fast bacilli were found to be of avian origin. She recovered uneventfully and function of the hand returned.

*Reported previously.[9]
**Reported previously.[10]
†Reported previously.[11]

It is of interest that the patients in Case 2 and 3 undoubtedly had silicosis. It is well known that certain relatively avirulent strains of acid-fast bacteria such as BCG and H37Ra can produce progressive tuberculous disease in silicotic guinea pigs.

Infection in man with avian tubercle bacilli may be more common than is suspected. Failure to disclose such infection may be due to the common use of guinea pigs for isolation of tubercle bacilli. The relative resistance of guinea pigs to avian tubercle bacilli precludes successful recovery of the microorganism. Another factor may be failure on the part of laboratory workers to recognize colonies of acid-fast bacilli that may be *Myco. avium*. The smooth moist appearance of cultures of avian tubercle bacilli is not typical of the human tubercle bacillus. Such cultures may be discarded as so-called saprophytes without additional studies. The use of rabbits and chickens in addition to guinea pigs for primary isolation, plus animal-pathogenicity tests on all cultures of acid-fast bacilli isolated in clinical laboratories, may disclose more instances of infection with avian tubercle bacilli than are now thought to exist.

References

1. Feldman, W. H.: Avian Tuberculosis Injections. Baltimore: Williams & Wilkins Company, 1938.
2. Lee, C. D.: A survey of avian-swine tuberculosis and methods for its control. Proc. Am. Vet. M. A., 1955, pp. 420-422.
3. Karlson, A. G.: Tuberculosis. In Dunne, H. W.: Diseases of Swine. Ames, Iowa: Iowa State College Press, 1958, pp. 377-391.
4. Sjöberg, K.: Tuberkulinreaktionen med aviärt tuberkulin vid fall av human tuberkulos. Nord. med., 8:2747, 1940.
5. World Health Organization Research Office: Sensitivity of human populations to human and avian tuberculins. Bull. World Health Organ., 12:85-99, 1955.
6. Edwards, Lydia B., Edwards, Phyllis Q., and Palmer, C. E.: Sources of tuberculin sensitivity in human populations: A summing up of recent epidemiologic research. Acta tuberc. Scandinav., Supplement 47:77-97, 1959.
7. Kuper, S. W. A.: Sensitivity to human and avian tuberculin among Africans in the Union of South Africa. Tubercle, Lond., 39:380-387 (Dec.), 1958.
8. Beitzke, H.: Über die Infektion des Menschen mit Hühnertuberkelbazillen. Ergebn. ges. Tuberk.-Forsch., 11:201-222, 1953.
9. Feldman, W. H., Hutchinson, Dorothy W., Schwarting, Virginia M., and Karlson, A. G.: Juvenile tuberculous infection, possibly of avian type. Am. J. Path., 25:1183-1195 (Nov.), 1949.
10. Karlson, A. G., Andersen, H. A., and Needham, G. M.: Isolation of avian tubercle bacilli in human silicosis. Dis. Chest, 28:451-457 (Oct.), 1955.
11. Karlson, A. G., and Feldman, W. H.: Mycobacteria of human origin resembling Mycobacterium avium. Proc. Internat. Vet. Cong., 1 (pt. 1):159-163, 1953.

Psychiatric Services to Courts

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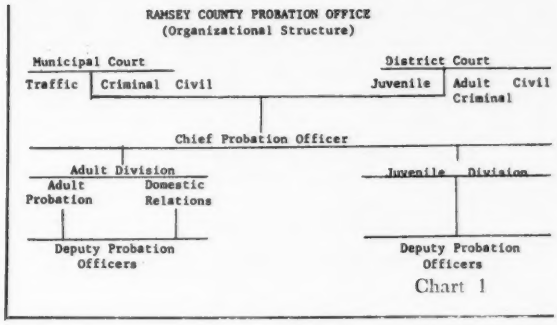


Chart 1

THIS PAPER is an outgrowth of the interest stimulated by the "Combined Law-Medicine Seminar" conducted at the University of Minnesota during the winter quarter of 1959. The seminar had as its goal the improvement of understanding and communications between the legal and medical professions. This paper, in a like manner, has as its aim the improvement of interprofessional understanding.

The specific focus of this paper is the juncture of law and medicine on the common ground of the study of the criminal offender. The paper will first deal with the existing court and probation services offered the courts of Hennepin and Ramsey Counties. It will then offer a prospectus for expansion and improvement of the existing court services.

Court Services Offered in Hennepin and Ramsey Counties

The two major services in this area will be described, compared and contrasted. In Ramsey County, the judicial organization follows the general model seen through the state. The district court bench has jurisdiction over felons of all ages, the majority of civil litigation and of juveniles, no matter what their offense. The St. Paul Municipal Court has jurisdiction over misdemeanors and minor civil litigation.

An important arm of the courts in Ramsey County is the Ramsey County Probation Office. This agency serves all of the courts in Ramsey County. The major functions of the probation office are: (1) doing the pre-sentence evaluation for the court; (2) supervising offenders placed on probation, (3) counseling in domestic relations. The organizational structure of the Ramsey County Probation Office is shown in Chart 1.

The major advantage of the organizational structure of the Ramsey County Probation Office is its ability to provide a unified service to all of the courts in the Ramsey County Area.

Psychiatric consultation to the Ramsey County Courts and Probation Office is in the form of a private psychiatrist who spends one half-day a week at the probation office. Offenders are referred to the psychiatrist by deputy probation officers or directly by the court. There are no specific services of a psychologist to the court at the present time. Offenders are all given M.M.P.I. (Minnesota Multiphasic Personality Inventory) at the time of referral to the psychiatrist. The M.M.P.I. profiles are at the disposal of the consulting psychiatrist, and are used to help evaluate the referred individuals.

The Hennepin County Department of Court Services is Hennepin County's counterpart of the Ramsey County Probation Office. It shows a slightly different organizational structure. In Hennepin County there is a separation between services to the District Court and to the Municipal Court. The Municipal Court has no specific psychiatric services but has at times made use of the facilities provided by the District Court. The court service agency for Hennepin County District Court has

the organizational structure shown in Chart 2.

It is apparent from Chart 2 that the Hennepin County Department of Court Services is organized on a broader plane than is the Ramsey

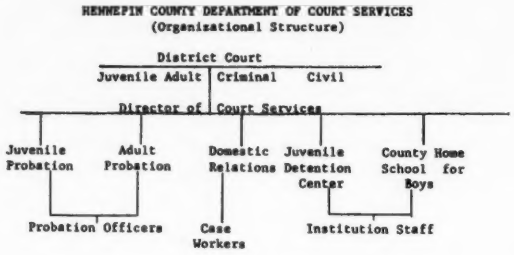


Chart 2

County Probation Office. Hennepin County includes institutional management in its court service agency as well as various probation and counseling services, whereas Ramsey County provides only probation and counseling services. On the other hand, Ramsey County has the advantage of a unified agency for all of the courts, whereas Hennepin County has not succeeded in effecting this kind of unification.

As to specific psychiatric and psychological services, Hennepin County has an arrangement which in some ways is similar to Ramsey County and in other ways different. The clinical staff, so called, of the Hennepin County Department of Court Services includes two full time psychologists and one psychiatrist who spends one-half day a week as court consultant. The usual route of referrals to the clinical staff is from the deputy probation officers, the domestic relations case workers and the staff of the juvenile detention center through their supervisors to the full time psychologists. The staff psychologist performs an evaluation which routinely includes an interview, some kind of personality test and most often a test of intelligence. The psychologist may extend his evaluation to include tests for brain damage and more complete personality testing with the Rorschach (ink blot test) and the T.A.T. (Thematic Apperception Test). There is a slight difference when the person referred is a juvenile. In this group a larger proportion of the total number of offenders who appear in court are referred for psychological testing, and the types of tests are fitted to the age of the offender. If, when he is finished with his evaluation, the psychologist believes that there is need for further consultation, he will refer the case to the psychiatrist.

One of the main differences between the Hennepin County and the Ramsey County psychiatric services is the nature of the offender who is being studied. In Ramsey County, the psychiatrist is consultant to a Municipal Court. This means that the offenders he sees have been accused of misdemeanors and further, he sees only adults. In Hennepin County, on the other hand, the psychiatric service is to the District Court; this means that the consultant sees people accused of felonies, and further, he sees both adults and children.

We turn next to a more detailed description of the function of the psychiatrist as consultant to the court. In one sense, the ultimate aim of the consultants in both Ramsey and Hennepin County is to help the court make wiser and more informed decisions as to the disposition and management of the people who come before the court. The differences between Hennepin County and Ramsey County are primarily in the specific manner of referral and the type of individual seen. The types of problems presented to the psychiatrist and the types of questions he is asked do not differ significantly between the two counties. For this reason, the authors felt justified in drawing primarily in this section from the first hand experience of one of them (Dr. Garetz).

A further elaboration of the psychiatrist's role as consultant to the court may be accomplished by considering the subject in two ways (1) A consideration of the function of the psychiatrist in terms of when, in the temporal sequence of events, the consultation may occur; (2) a consideration of the specific kinds of questions and problems which may be put to the psychiatric consultant.

Chart 3 depicts the sequence of events that occurs when an individual comes to the attention of the court.

The psychiatrist is most frequently asked to act as consultant during the pre-sentence period. At this time the individual has been convicted and the case has been referred to the court service agency for further evaluation to help determine disposition. A member of the staff (deputy probation officer) does a thorough study of the offender's social history, including family history, work record and record of previous court appearances. If, after having made such a study, the staff member feels that psychiatric consultation will be of benefit, a referral is made. The psychiatrist may see the individual in person or he may review all the records with the staff member without actually

seeing the offender. The psychiatrist then writes a report to the court which includes an evaluation of the person's psychiatric status and whatever specific recommendations are appropriate.

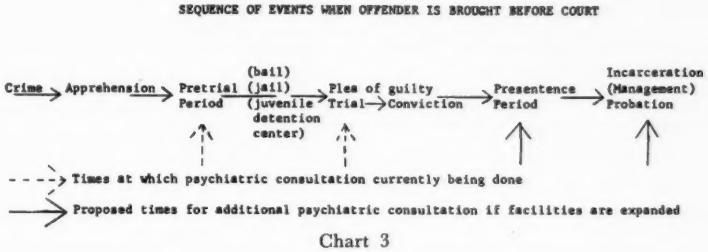


Chart 3

Psychiatric consultation is also frequently requested during the period designated as "management" in Chart 3. The offender (in the criminal cases) or the client (in the case of domestic relation case work) has at some time in the past been assigned by the court to Probation or to Domestic Relations. The staff member responsible for carrying out the probation supervision or domestic case work may ask for specific help in the management of the individual. In addition, referral may be made prior to the release of an individual from incarceration. In this latter case, the offender has already served all or part of a jail sentence and the psychiatrist is asked to see him for help in answering certain questions about the release of the offender.

Occasionally, the psychiatric consultant is asked to see an offender during the pre-trial period to determine whether or not the person is mentally capable of understanding the charge against him, or whether he is able to conduct an adequate defense.

The psychiatrist may also be consulted during the trial. Here he might be asked to testify as to the legal sanity of the offender who has entered a plea of innocence for reasons of insanity. At the present time the consultants to the Hennepin County and Ramsey County court services do not function in this manner.

The second approach to a description of the psychiatrist's function is in terms of the kinds of questions and problems presented to him. First, however, it is necessary to clarify some definitions and state some basic ideas.

Most psychiatrists agree that any individual who commits a serious anti-social act is ill. He is certainly ill in a social sense and is probably to be considered psychiatrically ill if the term is used in its broadest sense. However, the term "psychiatrically ill" is more often used in a restricted sense to mean illness for which psychiatrists have a specific diagnostic label. For example, an individual who commits pre-meditated murder may be considered ill in the broad sense even though a psychiatrist who examines him does not give him a psychiatric diagnosis. For this same person to be considered psychiatrically ill in the narrow sense, he would have to be describable in terms of some specific diagnostic category.

This brings us to another point which needs clarification. Reference will be made in the next section to several major categories of psychiatric diagnoses. The following definitions, although by no means exact or complete, will be adequate for our purposes. *Character and personality disorders* refer to people whose illness has become a way of life and is an integral part of their personality structure. These people are more likely to *act* in an abnormal way than to think or feel in an abnormal way. One important subgroup of the character disorders is the sociopath, an individual whose predominant problem is acting in an anti-social or dysocial manner. *Psychotic diagnoses* refer to people in whom the main characteristic is a loss of contact with reality. *Neurotic diagnoses* refer to people who have certain specific symptoms or combinations of symptoms (such as anxiety, phobias, compulsions, etc.). *Chronic brain syndromes* refer to people who show impaired intellectual functioning as a result of disease process or injury sustained during life. Mental retardation refers to impairment of intellectual functioning present from birth.

With the above definitions as background, the following figures are presented to show the distribution of diagnostic types seen in 100 individuals referred to the psychiatic consultant of the St. Paul Municipal Court. Twenty-five per cent were diagnosed sociopaths; 50 per cent were diagnosed character disorders other than sociopath; 25 per

cent were given various other diagnoses. Of this last 25 per cent, one-half were psychotic, one-fourth neurotic and one-fourth chronic brain syndrome or mentally retarded. It must be emphasized that the 100 cases summarized in the data are all people who were referred for psychiatric examination. This represents roughly 3 per cent of the total criminal calendar for Municipal Court. No diagnostic information is available for the 97 per cent who were not referred.

Returning now to the discussion of the kinds of problems and questions asked of the psychiatrist, the following frequently come up:

1. Is the offender a danger to himself or to society? To answer this question the consultant must evaluate the degree of depression, the presence and degree of psychosis, the previous behavior of the individual, and the amount of control the person has over his behavior at the time of the evaluation. If the psychiatrist is impressed with the potential danger of the offender, then he may recommend hospitalization, both for purposes of treatment and for the protection of society, or imprisonment in the case where there is no available psychiatric treatment.

2. A frequent question arising in domestic relations cases is "which spouse should gain custody of the children in a divorce action?" And a similar question is, "should one party in a divorce action be allowed visiting privileges?" The consultant here must evaluate the stability and responsibility of the parents and the likely effect, both positive and negative, on the children, of contact with either of the parents.

3. A large number of questions are asked regarding probation. These arise during the presentence period. The psychiatrist may be asked to evaluate whether or not the offender is a "good probation risk." He may be able to make specific recommendations as to whether probation supervision should be "loose" or "tight"; or he may be able to point out what particular role the probation officer should assume in his supervision with various offenders. He may further help determine some special contingencies of probation as with the alcoholic who must attend A.A. as part of his probation.

4. Certain problems arise during the management period (Chart 3). The psychiatrist may be asked to help determine whether continuation of probation is wise for someone who has not responded to probation supervision. Here he may be able to help the probation officer change his approach to the offender in such a way that the situation will improve; or he may be able to help the probation officer see that probation was perhaps an unwise disposition to begin with and that it should be rescinded.

5. Occasionally the psychiatrist is asked to see an offender who has served part of a jail sentence and determine if the individual is now ready for probation supervision.

The answers to a whole series of questions are an extremely important contribution of the psychiatric consultant. This involves recommendations for specific psychiatric treatment beyond probation supervision. The psychiatrist may recommend that the individual be referred to a psychiatric clinic for psychotherapy, to a social agency for case work counseling, to a hospital for some specific treatment such as electroshock therapy, or to a private physician for evaluation and treatment of some particular physical ailment.

Recommendations for Expansion and Improvement of Existing Psychiatric Services

Before going ahead with recommendations, it is important to point out that both the Ramsey County Probation Office and the Hennepin County Department of Court Services have done a commendable job in providing the psychiatric services that they now have. The whole area of court psychiatry is one which has tended to be neglected in the past both by psychiatrists and by the courts. Current psychiatric consultation to the courts is of high quality and the present services are certainly a step in the right direction.

However, there appear to be a number of definite limitations in the existing services. Certainly the amount of service available is less than what is needed. Cases which should be presented to the psychiatric consultant are probably not presented because of his time limitation. The question arises as to whether or not a full-time psychiatric consultant to the court is a desirable goal. Generally, psychiatrists doing court work feel that it is better to have a psychiatrist consult on a part-time basis. This would mean that to meet the needs of the court for psychiatric consultation, it would be necessary to have the psychiatrist spend more than one-half day a week doing court work or to have several psychiatrists instead of one. The reason usually given for this point of view is that it would

be difficult for the psychiatrist to maintain a high level of interest in his work if all he did was evaluate offenders.

However, this leads to another set of recommendations. It would be possible for a psychiatrist to work full time in such a setting if the organization of the psychiatric services was in the form of a court clinic. By court clinic, we mean a structure in which all of the necessary psychiatric and psychological services to the court would be provided by a more or less self-contained clinic. (An outline of a possible structure for a court clinic is given in Chart 4). The ideas for this model court clinic come from the experience of the authors and from examination of other court services, particularly the court clinic for the Court of Special Sessions in New York City.

The director, a full-time psychiatrist, would coordinate the activities of all other members of the clinical staff. In addition, he would be available to give advice on specific problems and would act as a liaison between the clinical staff and the court.

The psychologist would have several functions. He would perform psychological testings and interpret their results. This could be a routine battery for all individuals referred to the clinic consisting of the M.M.P.I. and the Shipley Hartford (estimate of intelligences). He would do further testing when indicated. The psychologist would also have an important role in research. Research activities would be planned jointly by the director and the psychologists and carried out by all of the clinical staff. The research assistants would do statistical and clerical jobs.

It is worth expanding a little on the topic of research. One of the harsh realities of court work is that it is extremely difficult to modify the antisocial behavior of a large proportion of offenders. Further, crime, delinquency and the like are massive social problems. It seems evident that, as important as it is to provide service to the court, it is equally important to be ever searching for ways of better handling the offender and of preventing people from becoming criminals. Research is necessary to insure progress in this area. The court clinic is an ideal place for such research.

Returning to the staff of the court clinic, we next consider the function of the social worker. This staff member would collect information about the offenders which would help in the evaluation. He would also do case work counselling with certain selected offenders.

One of the functions of the part-time psychiatric consultant would be to supervise the social worker doing case work counselling. Another set of duties would be those currently performed by the psychi-

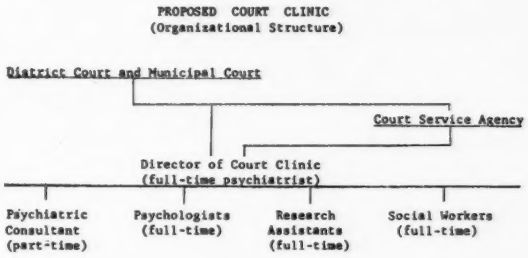


Chart 4

atric consultant. A final important function of the new part-time consultant would be prescribing medications to selected offenders who need such medication as part of their total management by the court clinic.

In addition to all of the activities outlined above, the court clinic could potentially serve the court in two areas which in the current existing court services are being neglected. Namely, evaluations in the pre-trial period and evaluations and testimony during the trial. If this were the case, a long step would be taken to eliminate the battle of the experts on the witness stand.

Such a model court clinic presents many difficulties. The greatest difficulty is in getting funds to support such a clinic. Another equally important problem is getting trained people interested in working in such a setting. However, in spite of the problems, such a clinic is well within realistic aspirations. Both Ramsey County and Hennepin County are moving in the right direction. The ultimate goal of achieving a court clinic that will meet the needs of the community will require the sustained effort and interest of people from both the legal and the medical professions. It is hoped that this paper will play a part in stimulating such interest and effort.

Acknowledgments

The authors wish to express their appreciation to the judges of Hennepin and Ramsey Counties, the Ramsey County Probation Office and the Hennepin County Department of Court Services for help in preparing this paper.

Injuries of the Brain Caused by Penetration of the Orbit (Pitchforks, Sled Runners, Arrows, Etc.)

Among the hazards to which active children are exposed are severe brain injuries caused by low-velocity missiles penetrating the orbit. Five such cases are reported. The prognosis should be guarded, because extensive and permanent incapacity may follow what appears to be a relatively minor injury.

INJURY to intracranial structures inflicted by objects which penetrate transorbitally is unusual in peacetime. Orbital cranial wounds, secondary to high-velocity missiles, are common in time of war, a subject which has been reviewed by several authors.[1,2] In contrast to the injuries from high-velocity wartime missiles, the injuries produced by low-velocity objects present a unique clinical problem.

In the last five years five cases of intracranial injury secondary to transorbital penetration by low-velocity missiles have been recorded at the Mayo Clinic. The occurrence of three such injuries within the last few months prompted us to review the literature on this subject and to present reports of the cases in question.

Anatomic Aspects

The important anatomic features to be considered in this type of injury have been discussed by McClure and Gardner.[3] Some knowledge of the anatomy of the intra-orbital contents and adjacent intracranial structures is necessary to an understanding of the clinical syndromes secondary to this type of injury and to the management of the victims.

The orbital cavities are roughly pyramidal in shape, the base of the pyramid being represented by the orbital rim. The orbit is formed by the frontal, ethmoid and lacrimal processes and the zygomatic portion of the temporal bone and the greater wing of the sphenoid bone. At the apex of the orbit is the optic foramen through which pass the optic nerve and the ophthalmic artery. Lateral to the optic foramen are the superior and inferior orbital fissures. Passing through the superior orbital fissure are the superior and inferior divisions of the oculomotor nerve, the trochlear nerve, the abducens nerve, the nasociliary nerve, the frontal nerve and the ophthalmic vein. The globe of the eye is movable, and is surrounded by fibrofatty tissue, the extra-ocular muscles, nerves and blood vessels.[4]

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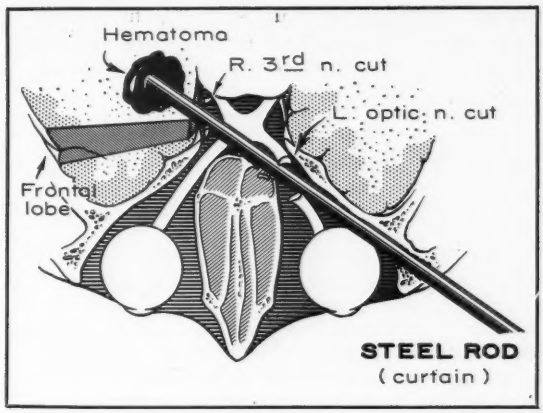


Fig. 1. Course of the foreign body through the orbit in Case 1.

From the Section of Neurologic Surgery and the Section of Ophthalmology, Mayo Clinic and Mayo Foundation, a part of the Graduate School of the University of Minnesota, Rochester, Minnesota.

Rupture of the globe by large blunt objects such as stones, golf balls, tennis balls and the like frequently occurs, but because the globe is movable and may be displaced by low-velocity blunt objects, it often escapes injury. A long, rigid missile will tend to be deflected by the walls of the orbit to the region of the apex, where the nerves and vessels are concentrated. The bony orbit, except for the rim and lateral borders, is thin, and therefore may be penetrated easily at any of the vulnerable points.

Resting on the roof of the orbit is the inferior portion of the frontal lobe of the brain. This anatomic relationship is especially advantageous to the neurologic surgeon in the performance of transorbital prefrontal lobotomy. In the middle cranial fossa, behind the greater wing of the sphenoid process, are the internal carotid artery and its branches, located in close proximity to the cavernous sinus, the pituitary gland and the hypothalamus.

The many complications and the various clinical findings associated with all penetrating wounds about the orbit are understandable when the anatomy of this region is carefully considered.

Review of the Literature

The first comprehensive review of injuries of the type under consideration was made in 1930 by Birch-Hirschfield,[5] who reported on 172 cases of stab wounds of the orbit, including three cases of his own. Of these, 125 cases involved lesions of the optic nerve. Twenty patients died, eleven of meningitis, six from injury to the internal carotid artery, and three from tetanus. McClure and Gardner[3] in 1949 reviewed the literature and presented four cases. These authors were impressed by the fact that the eyeball frequently escapes injury in such incidents. They had the impression that intracranial damage should be expected in all cases of stab wounds about the orbit. Kjer[6] reported on fifteen cases of orbital and transorbital stab wounds. He noted the important fact that three of his nine patients with intracranial injury did not exhibit symptoms of intracranial damage

immediately after the injury. Three of his patients died of causes secondary to the injury. These deaths were the results of tetanus, cerebral edema and encephalitis.

Aside from the above-mentioned reviews, many reports of isolated cases have been published.

Report of Cases

Case 1.—A 7½-year-old girl was admitted to the Mayo Clinic with a history of unconsciousness of three hours' duration which followed injury below the left eye inflicted with a piece of steel about the size of a curtain rod. The child had been injured when a small boy threw a steel rod into a tree in an effort to dislodge his kite. At the time, the patient had been looking up at the kite and had received a penetrating injury in the left maxillary region when the rod fell earthward (Fig. 1). The rod was immediately withdrawn by the patient's mother and the child was taken to a local physician, who referred her to the clinic. The actual depth of penetration was not known.

At admission the patient was comatose. The blood pressure was 118 systolic, and 52 diastolic, in millimeters of mercury; the pulse rate was 96 beats per minute and the temperature was 102.4° F. There was a puncture wound in the left cheek beneath the eye. Both pupils were dilated and fixed, and the left eye was closed by edema and ecchymosis. The optic fundi were normal. Neurologic examination disclosed left hemiplegia; the Babinski response was elicited bilaterally. General physical examination revealed no other abnormalities. Roentgenograms of the skull clearly showed a fracture involving the left antrum. Results of routine laboratory tests were within normal limits.

On the day the patient was admitted, left transfrontal craniotomy and right temporal burr-hole exploration were performed. A marked degree of cerebral edema was noted. The left frontal lobe was resected and damage to the left optic nerve was seen. Fracture of the roof of the orbit was not found. Because of extreme swelling of the brain, the bone flap was left out for purposes of decompression, and tracheotomy was performed postoperatively. Antibiotic agents and prophylaxis against tetanus were employed.

The child remained in coma and showed no evidence of neurologic improvement. Approximately a month after admission she was dismissed to receive nursing care at a hospital near her home. Over a five-month period the patient gradually improved. When she returned for reexamination six months after the injury, she exhibited expressive aphasia and was unable to walk by herself because of left hemiplegia. Examination of the eyes at this time showed divergent strabismus, with almost complete paralysis of the ocular movements. Ptosis of the right lid was seen. The left optic disk was affected by pallor of grade 3 and the right disk exhibited minimal pallor. At this time physiotherapy was instituted and lengthening of the Achilles tendon on the left was performed.

Nine months after the injury the patient was readmitted for repair of the cranial defect secondary to the transfrontal craniotomy. During the operation, a cystic area in the left frontal lobe was encountered. A defect in the wall of the left lateral ventricle was repaired with an ivalon graft. Repair of the cranial defect was delayed because of this lesion. She returned three months later, a year after the original accident, and cranioplasty with acrylic material was done. The postoperative course was uneventful.

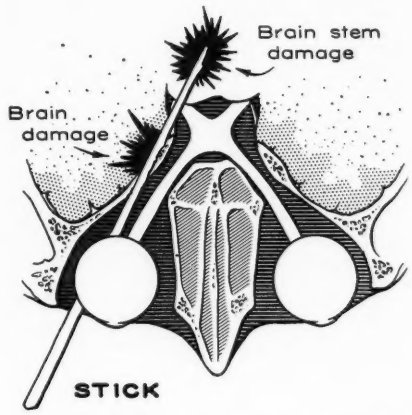


Fig. 2. Course of the foreign body through the orbit in Case 2.

The patient returned six months later for correction of the ptosis of the right lid. When she was last seen three years after the injury, examination of the eyes revealed little movement of the left eye and a fixed right eye with slight ptosis. Examination of the optic fundi showed dilated, fixed pupils. The right optic disk was affected by grade 2 pallor, but the fundus otherwise was normal. Grade 4 pallor was noted in the left optic disk.

When this patient was last heard from, nine months after the foregoing examination, she was able to be up and about and was attending a school for the blind. The aphasia had abated to a point at which she had only slight hesitancy in speech.

Case 2.—A 7-year-old boy was struck beneath the right eye with a stick while playing with friends. He walked to his home and suffered no immediate ill effects from the injury. After arriving home, however, he very rapidly became incoherent and drowsy. He was immediately taken to his family physician who sutured the wound of entry and transferred him to the clinic, after administering antibiotic agents and tetanus toxoid. At the time of admission the child was comatose, and exhibited periods of extreme restlessness.

The blood pressure was 152 systolic and 52 diastolic, in millimeters of mercury; the pulse rate was 80 per minute and the temperature was 105° F. Ecchymotic swelling involved the upper lid of the right eye, and there was a sutured laceration of the inner aspect of the upper lid. This laceration appeared to involve the upper canaliculus of the lacrimal apparatus. The pupils were of equal size and reacted to light. The ophthalmologist felt that there had been no damage to the right globe. Results of neurologic examination otherwise were nega-

tive and roentgenograms of the skull showed no fracture.

Bifrontal craniotomy was performed on the day of the patient's admission. A marked degree of swelling of the brain was noted, and fracture of the roof of the right orbit, with laceration of the dura and brain, was found (Fig. 2). The damaged areas were debrided, and a portion of the right frontal lobe was removed for purposes of decompression.

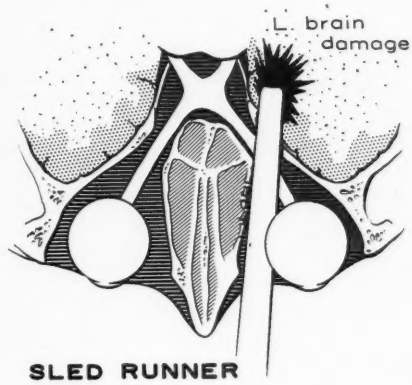


Fig. 3. Course of the foreign body through the orbit in Case 3.

Postoperatively, the patient failed to regain consciousness. The temperature persisted at 105° F. and tremors of the right upper extremity and episodes of decerebrate rigidity developed. On the day after the operation, tracheotomy was performed. The next day the patient died.

Postmortem examination demonstrated purulent meningitis, abscess of the left frontal lobe and empyema of the right orbit.

Case 3.—A 9-year-old boy was transferred to the clinic after hospitalization for 10 days in another city. While he was out sledding with friends, the patient overtook a sled in front of him which for unknown reasons suddenly stopped. A sled runner inflicted an injury to the left eye. The boy was immediately taken to a local hospital, where the wound of entry was debrided and sutured. He received tetanus antitoxin and antibiotic agents. He did not lose consciousness at the time of the injury, and he complained only of neck pain and stiffness. But since irritability, drowsiness and fever developed, he was transferred to the clinic for further study.

He was found to be an alert, irritable boy with marked chemosis and ecchymosis of the soft tissues of the left orbit. The left globe appeared to be intact; the boy said he was able to see with it. The globe was fixed. Examination of the optic fundus on this side was impossible because of extreme corneal edema. The pupil was dilated and fixed. An extreme degree of irritability similarly precluded examination of the visual fields. Neurologic examination at this time showed no deficit, except for a stiff neck and elicitation of Kernig's sign. Results of routine laboratory studies were within normal limits, and roentgenograms of the skull disclosed no evidence of fracture. Roentgenograms of the orbital aspects likewise revealed no definite fracture.

The next day the child became more irritable and hyperactive. Progressive proptosis of the left eyeball was noted, and Babinski's sign was demonstrated on the right side. Electroencephalography performed at this time recorded a grade 1 localization of delta waves in the left sylvian region, associated with grade 2 generalized dysrhythmia. Evidence of increasing cerebral irritation persisted. Two days after admission of the patient left transfrontal craniotomy was performed.

An intracerebral hematoma was evacuated from the left frontal lobe. Debridement of a large penetration through the orbital plate was necessary; there were multiple fractures extending into the ethmoidal sinuses (Fig. 3). The left optic nerve appeared to be intact. The contents of the orbit were explored, but no evidence of increased intra-orbital pressure was found. The periorbita was left open for purposes of decompression.

Postoperatively, the child responded promptly to the intracranial decompression, but on the fourth day diabetes insipidus developed which was controlled by the use of vasopressin (Pitressin). Chemosis and proptosis of the left eye persisted, and for these reasons, two weeks after craniotomy, complete blepharorrhaphy was performed on the left side. General improvement continued and the child was dismissed from the hospital a month after the operation.

The patient was re-examined seven months later, at which time it was noted that the diabetes insipidus had disappeared entirely. The boy was in good condition. He could perceive light in the left eye, but it was thought advisable not to open the eyelid until the orbital bone should have had more time to recalcify.

Case 4.—A 10-year-old boy was admitted to the clinic about three hours after injury to the right orbit inflicted by the tine of a pitchfork. He was not unconscious after the injury, and gross damage had not been noted by his family physician, who referred him to the clinic after administering tetanus toxoid.

The child was found to be awake, alert and co-operative. The blood pressure was 122 systolic and 72 diastolic, in millimeters of mercury; the pulse rate was 88 beats per minute and the temperature was 100° F. per rectum. A general physical examination disclosed no abnormalities. The right eye was ecchymotic and the lids were closed. There was a small slit in the skin at the tip of the lateral canthus and a large conjunctival hemorrhage. Proptosis of 4 to 5 cm. was noted. The globe was fixed. Grade 4 ptosis of the upper lid and iridoplegia also were present. Corneal sensation was diminished. Funduscopic examination of both eyes disclosed no abnormality. Vision in the left eye was normal, and some degree of vision remained in the right eye. Neurologic examination disclosed no abnormalities. Roentgenograms of the skull revealed no fracture, but roentgenograms made in special orbital views demonstrated a fracture medial to the superior orbital fissure. The electroencephalogram recorded dysrhythmia of grade 2, generalized, and maximal in the right anterior cerebrum. A delta-wave focus

of grade 2 was generalized but was maximal on the right.

The administration of antibiotic agents was started and the child was observed. The next day the neck became stiff and Kernig's sign was elicited, but otherwise the child's condition was unchanged. Examination of the eyes three days after admission of the patient showed some abatement of the ptosis, and the child could read to the extent of 14/21 with a +3.00 lens in the right eye. The fundus remained normal. Lumbar puncture done four days after admission of the patient disclosed blood in the cerebrospinal fluid, grade 3, and the initial pressure of the fluid was 43 cm. by water manometer. Culture of specimens of the cerebrospinal fluid gave negative results. Repeated spinal paracentesis failed to reveal evidence of meningitis, but the amount of blood in the cerebrospinal fluid gradually lessened. The boy was dismissed seventeen days after his admission, with no abatement of the ophthalmoplegia.

The patient returned a month after dismissal, complaining of sudden loss of vision in the right eye three days previously. The next day, in the course of a neurologic examination, the patient suddenly clasped his hands to his forehead and was attacked by a generalized seizure. After this he complained of severe headache.

Results of a physical examination at this time were not remarkable. The neurologic examination disclosed nothing abnormal, and examination of the eyes showed that the ocular condition was unchanged (complete ophthalmoplegia, blindness on the right). An electroencephalogram showed delta waves of grade 1 on the right, frontosylvian, and dysrhythmia of grade 2, generalized, and maximal in the right hemisphere. Lumbar puncture showed the initial pressure of the cerebrospinal fluid to be 40 cm. of water and the fluid to be grossly bloody. Culture of a specimen of cerebrospinal fluid gave negative results.

Antibiotic agents were administered. The temperature was 103° F. on the second day after admission and the patient experienced a convulsive seizure involving the left upper extremity during the day. Ventricular studies showed evidence of subdural collection of blood. Right frontal craniotomy was performed and an intracerebral hematoma was evacuated (Fig. 4). A wound tract into the parietal region was debrided. Because of marked edema, the bone flap was left out. The patient rallied slowly postoperatively but remained blind. Gradually the right ophthalmoplegia abated and the patient was dismissed twenty-six days after admission.

The patient then returned home, where he gradually improved and was up and about. One evening at the dinner table he vomited, and severe headache developed. Within a few seconds he became comatose. His parents brought him to the clinic immediately.

At the time he was admitted a bulging, tense decompressive site in the right frontal region was seen; the pupils were dilated and fixed and Babinski's reflex was elicited bilaterally. The general physical examination provided no remarkable information. The patient was immediately taken to the operating room, where the previously made skin flap was reflected with the aid of local anesthesia. A portion of the right frontal lobe was resected; the right lateral ventricle was found to be filled with blood. The blood could be seen through the foramen of Monro, which was enlarged. Clotted and liquid blood was removed from the third ventricle. After evacuation of blood from the ventricular system the

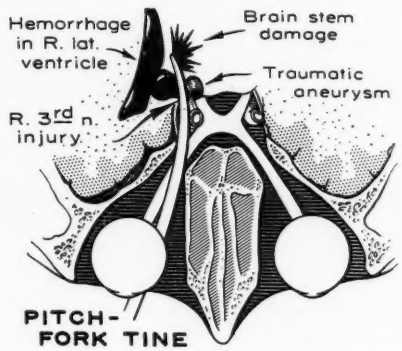


Fig. 4. Course of the foreign body through the orbit in Case 4.

chiasm was inspected. The right optic nerve was small, hard and gray, and was displaced anteriorly by a pulsating blue mass beneath it. This mass was judged to be a post-traumatic aneurysm (Fig. 4), but the condition of the child precluded further definitive treatment at that time. The mass was surrounded by cotton, hemostasis was ensured and the wound was closed without drainage. Tracheotomy was performed immediately postoperatively.

The child did not regain consciousness postoperatively, and six months after the operation was living but had not returned to consciousness.

Case 5.—A 9-year-old boy was admitted to the clinic because of an injury sustained when he had fallen while carrying an arrow in his hand. The point of the arrow struck him near the inner canthus of the right lower eyelid (Fig. 5). He was not unconscious, but left hemiplegia immediately developed. Shortly after the injury he vomited, and his guardians noted that he was very drowsy.

General physical examination of the patient in the hospital produced no significant information. The blood pressure was 110 systolic and 80 diastolic, in millimeters of mercury; the pulse rate was 80 per minute and the rectal temperature was 99° F. Examination of the eyes revealed no injury to the globe, and the extraocular muscles functioned normally. Vision was good. There was some downward displacement of the right globe.

Neurologic examination revealed a drowsy but easily aroused child. Hemiplegia of grade 3 was present on the left, with facial weakness of a central type. Babinski's sign was elicited on that side. Roentgenograms of the skull showed nothing but a fracture through the roof of the right orbit medially, and a minute elevated fragment of the floor of the anterior fossa. Results of routine laboratory examinations were within normal limits.

A prophylactic injection of tetanus toxoid was given

and penicillin and streptomycin were administered. The patient was observed closely at the hospital. Two days after the patient's admission, lumbar puncture yielded xanthochromic cerebrospinal fluid under initial pressure of 30 cm. of water. The fluid contained 5461 erythrocytes and 171 lymphocytes per cubic millimeter, and the

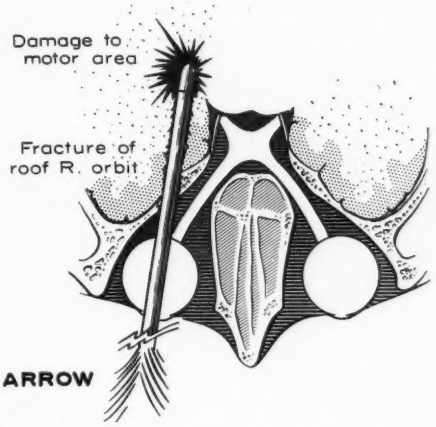


Fig. 5. Course of the foreign body through the orbit in Case 5.

value for protein was 133 mg. per 100 cc. Smears and results of culture were of no significance.

The patient gradually improved, and physiotherapy was instituted. He was dismissed from the hospital three weeks after the injury, and was advised to continue physiotherapy as an outpatient.

This patient was last examined three months after the injury. At that time, he exhibited mild spastic left hemiparesis which required the use of a cane for walking. The patient had returned to school and was doing well otherwise. He made no complaints referable to the right eye.

Comment

It was previously noted that the injuries under consideration were inflicted by missiles of low velocity. It is also apparent, from the data in our reports of cases, that almost all such injuries are secondary to penetration of the bony orbit by long, thin objects. Aside from the objects concerned in this report, some of the instruments responsible for injury in other cases have been broken twigs, a keyhole saw, scythe point, iron bar, fencing foil and ice pick.

The injuries obviously are compound fractures of the skull, and demand that immediate precautions against intracranial or intra-orbital infection and prophylaxis against tetanus infection be carried out. Freeman[7] has reported a series of 628 transorbital leukotomies covering the years from 1946 to 1954, with only seven deaths (1 per cent) attributable to the operation. It is therefore obvious that even though penetrating orbital wounds may be associated with serious intracranial injury, such is not always the case when the injury is perforation of the superior orbital plate.

Summary and Conclusions

Five reports of transorbital injury to the brain have been presented. The salient anatomic and pathologic features of injuries in this area have been demonstrated.

It is obvious that injuries to the brain inflicted by penetration of the orbit constitute a very serious and particularly debilitating problem. Many times a roentgenogram of the skull does not reveal a small fracture through the orbit; when this is true the physician may be misled into a sense of false security because the injury, although present, was not perceived. Nonetheless, in the early phase of any instance of this type of trauma, steps should be taken to ensure the patient against infection. A period of neurologic observation usually is advisable because of the possible sequelae of what appears to be only a minor injury. Sometimes four to six weeks will pass before a prognosis of the visual consequences of such an injury can be given. Any definitive treatment of the visual system had best be deferred until the other, more serious, cerebral complications have been mastered. Very likely, because of the relatively violent physical activity involved in such injuries, most of the victims will be boys. Four of our patients were boys; one was a girl who chanced to be on the scene of somewhat violent, or at least dangerous, activity on the part of boys.

References

1. Schorstein, Joseph: Gunshot wounds of the fronto-orbital region. Lancet, 1:44-47 (Jan. 8) 1944.
2. Webster, J. E., Schneider, R. C. and Lofstrom, J. E.: Observations upon the management of orbito-cranial wounds. J. Neurosurg., 3:329-336 (July) 1946.
3. McClure, C. C., Jr., and Gardner, W. J.: Trans-orbital intracranial stab wounds. Cleveland Clin. Quart., 16-17:118-125 (July) 1949.
4. Hollinshead, W. H.: Anatomy for Surgeons. Vol. 1, The Head and Neck. New York: Harper & Brothers, 1954.
5. Birch-Hirschfield, A.: Die Stichverletzungen der Orbita. In Graefe, A. and Saemisch, T.: Handbuch der gesamten Augenheilkunde. Berlin: Springer-Verlag, vol. 9, 1930.
6. Kjer, Poul: Orbital and transorbital stab wounds. A.M.A. Arch. Ophth., 51:811-821 (June) 1954.
7. Freeman, Walter: Frontal lobotomy 1936-1956: A follow-up study of 3,000 patients from one to twenty years. Am. J. Psychiat., 113:877-886 (April) 1957.

Fractures among Children

II. Some Practical Principles of Treatment of Common Fractures

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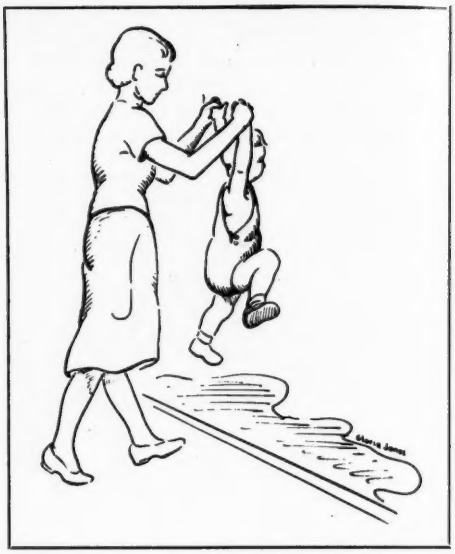


Fig. 10. Usual way in which elbow injuries are incurred. Tear of orbicular ligament or dislocation of head of radius.

Part I, Parental Assault as Causative Agent, appeared in the September issue.

THERE are two categories of fractures among children that are more prevalent than those caused by assault and neglect: (1) the common larger group of simple fractures incurred at play or during the normal activities of childhood and (2) a smaller more serious group of complex fractures from motor accidents.

It is well to be mindful that although reformation of deformities with fractures does occur early in children, nevertheless every precaution is necessary to prevent angulation and rotation of the long bones, especially at the usual sites: the forearm near the wrist, the humerous, the femur, and the tibia. When the fracture is near the joint, epiphyseal injury may be associated. When it is, reduction may be done under general anesthesia provided the stomach is empty even if this means a delay of several hours. Notwithstanding the high degree of self-correction among children through epiphyseal growth, repeated follow-up roentgenographic studies are indicated in order to safeguard against excessive loss of length.

Most fractures of the forearm, including the wrist, are of the simple cortical green stick type or the torus type. They have minimal angulation, are not displaced, and require only simple measures of temporary immobilization. Ace bandaging or an extremely lightweight cast are generally suitable but they must not be tight. Only exceptionally are these fractures seriously displaced, overriding or angulated. Fractures of the upper third of the forearm require more supination of the forearm than do those of the middle third or the lower third which require more pronation. It is necessary to take into account the direction of pull and strain of the muscles in and around the fractured sites in order to follow the correct direction in anatomic positioning.

One of the commonest but most difficult fractures to treat is that of the lower sixth portion of the forearm in which there is dorsal displacement of the distal short fragments. An overriding deformity requires some technical skill in correcting (Figs. 8 and 9). The general plan of treatment is

the application of a well padded forearm cast, preferably extending above the elbow, which is worn for six to eight weeks. The usual way in which injuries to the elbow are incurred is by sudden hyperextension of the upper extremities (Fig. 10). Although the usual supracondylar fracture of the elbow results in good alignment, the occasional one (Fig. 11) may require an osteotomy of the humerus for correction.



Fig. 8. Case of boy, aged seven years. Both bone forearm fracture (lower sixth) treated by hyperextension, proper levering of bone, and application of circular cast.

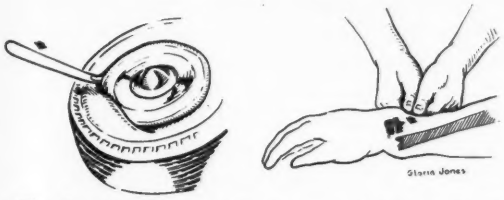


Fig. 9. Method of reducing lower sixth both bone fracture of wrist.

Another type of fracture, less common but more serious and sometimes disastrous, is the Monteggia fracture. This upper sixth portion of the ulna with the head of the radius displaced calls for reduction of the fragments by hyperextension and traction in order to achieve integrity of the elbow joint. Extension of the elbow followed by careful flexion and firm pressure over the head of the radius are essential. The surgeon's thumb acts as a lever to bring the fracture over the fractured site. It is, however, seldom opened for replacement of this

bone. The patient's forearm is pronated before application of a lightweight padded cast.

The secondary scarring, fibrosis, and serious calcification observed in adults do not as a rule happen to children. Pressure must not be increased by tight cases or bandages on the arterial inflow or venous return, for this may bring about neurovascular-muscular complications leading to the dire consequence of Volkmann's ischemic contracture (Fig. 12). The physician must also be watchful for any spicule of bone which can cut into an artery to cause a false dissecting aneurysm or an arteriovenous aneurysm. Casts should be well padded and replaced if necessary in several days. Roentgenographic follow-up studies are indicated to ascertain any displacement.



Fig. 11. Typical supracondylar (elbow a, a_1) fracture, treated conventionally by extension and flexion of the elbow. Osteotomy necessary to correct cubitus varus deformity (b, b_1).

Fractures of the clavicle are treated by immobilization of the involved shoulder for two to six weeks, depending on how severe the fracture is, how much displacement there is, and how much associated soft tissue involvement. For the simple cortical mildly deformed fracture, adhesive tape retention (unless the skin is sensitive to adhesive tape) or a sling is sufficient. Because it is difficult to keep such a bandage on an active child, some children may require lightweight spica casts including both sternoclavicular joints, applied comfortably, with the shoulders immobilized properly. A spica cast seems to serve better than the figure-of-eight bandage. This reduces the swelling and relieves pain. Although pseudo-arthrosis of the clavicle is a cause of mildly painful deformity, it is an uncommon finding. A 20° angulation is an arbitrary gauge for reduction in correcting the fractured site by manipulation with or without general anesthesia.

Fractures of the femur among infants are generally associated with swelling and local hematoma (Fig. 13). When the patient is under three or four years of age, such fractures are best treated by the conventional Bryant's traction, provided extreme care is exercised in the application of the moleskin and bandages, and provided peripheral circulation is scrupulously watched. Both extremities should be carefully padded, and moleskin tape or foam rubber strips applied without constriction. Again, tight Ace bandages are contraindicated. This is worth repetition. Its importance cannot be too forcefully inculcated in the attending physician's mind. The physician, nurse, mother, or whoever is in charge, must watch closely for circulatory changes by observing the color of the extremities. The leg opposite the one injured must be watched just as closely, because sometimes its circulation is affected. When it is, traction must be removed at once. Irreparable harm is likely if these provisions are not met: contractions of the foot, wasting from fibrosis of the calf muscles, scarring of the knee and ankle joints—all are possible but can be prevented by attention to the circulation. Precaution against

soft tissue injury associated with fractures is especially imperative to prevent gangrene (Fig. 14). With normal progress, from four to six weeks' traction may be sufficient. Wearing of a spica cast



Fig. 12. Ischemic fibrosis of both legs, following fracture of the left femur. Treated by Bryant's traction method.

may replace traction unless the callus, as observed roentgenographically, is firm.

For older children, from six to twelve years of age, the conventional traction by a Thomas splint or Russell traction is advisable. The shaft of the femur need not be completely reduced. Side-to-side bone contact is adequate for correction; but rotation and angulation must be prevented. Duration of traction is longer than for younger children and more weight is necessary. The principle of proper alignment to avoid rotation and angulation must be adhered to for the lower extremity as for the upper. Regulation of traction and re-application of bandages or moleskin must be carried through regularly and carefully.

A special group of fractures is represented by compression injuries of the foot (Figs. 15 and 16) and of the hand. Compression states of the tissues may necessitate amputations at Chopart's or Lisfranc's joints. Because of serious hemorrhages in these areas and pressure on the lymphatic vessels, obstruction of lymphatic drainage, local deep scarring and superficial tissue necrosis may ensue. Injuries to the foot are more hazardous than to the hand because of obstruction of circulation and thrombosis in the digital vessels with or without ultimate gangrene of the soft tissues.

Certain assault injuries with associated soft tissue interposition may need plating (Fig. 17). Unfortunately in the case shown in Figure 17, a complication followed: pressure necrosis of the heel from a footboard during traction. Osteomyelitis of the calcaneous is shown in the inllustration (Fig. 18).

Complicated or complex fractures in and about joints are serious; they are incurred mostly during motor accidents and usually require direct surgical approach for correction. Treatment must be skillful. Even so, they frequently result in some degree of joint immobility, shortening or deformity. In addition to the Monteggia fracture already mentioned, isolated condylar fractures in and about the elbow joint or in and about the knee joint require particular attention.

Fractures of the outer condyle through the capitellum require open reduction and fixation with

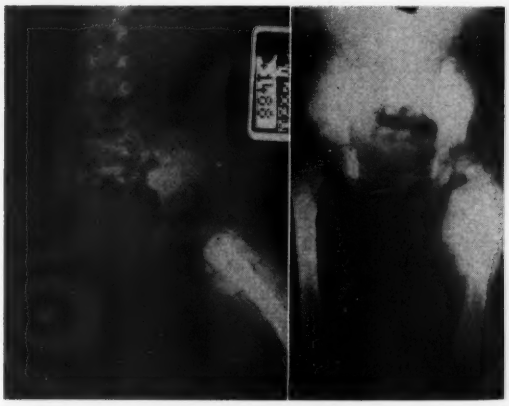


Fig. 13. Fractured femur, shaft and neck. Note calcification, not infrequent from severe hematoma.

pins or screws (Fig. 19). Closed reduction does not resolve the problem in most of these instances. Hyperextension injuries of the elbow joint, causing displacement of the head of the radius, can be reduced at times under general anesthesia by careful gentle pressure while the arm is extended after first flexing the joint, and by applying pressure throughout this maneuver to the head of the radius.

The most serious injuries are the ones that need immediate attention: fractures through the femoral epiphysis with or without pieces of diaphysis. In such a case pin fixation may be necessary (Figs. 20 and 21). On the other hand, gentle firm traction, manipulation in extension and flexion may reduce the displaced distal short fragment without the necessity of surgical correction. If a

pin or screw is necessary, it should be inserted so as to avoid the growing epiphysis. If not treated properly, serious interference with function of joints and permanent crippling may eventuate

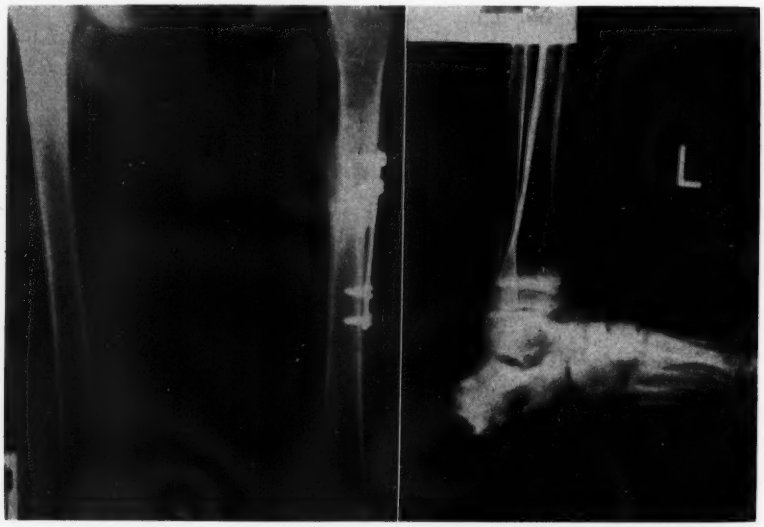
fractures with separation, the rare pelvic fracture with symphysis pubis separation—these are examples of the types of cases among children that probably will require open reduction. Other situ-



Fig. 14. Gangrene of foot from tight cast.



Figs. 15 and 16. Compression injuries of feet. Gangrene and ultimate amputation.



Figs. 17 and 18. Colored girl, aged nine years. Open reduction for fractured femur from assault injury. Subsequent surgery necessary for osteomyelitis of heel and local tissue necrosis from pressure of footboard incident to traction. (Case not reported in text.)

(Figs. 22 and 23). If conservative attempts at reduction fail, open reduction must be resorted to as in the elbow case shown in Fig. 24.

Olecranon fractures with separation, patellar

ations in which open reduction may have to be resorted to are: when the neck of the femur has been fractured (Figs. 25 and 26); when fragments

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must be reduced in and about the knee joint or for fracture of a single condyle of the femur when the fragments have been displaced (although most fractures of the latter type, including epiphyseal displacements and metaphyseal fractures, can be reduced on the fracture table under steady traction, after which a spica cast must be worn from eight to twelve weeks).

Summary and Conclusions

Fractures among children have been discussed from two points of view: (1) the importance of history-taking in conjunction with taking into account all physical signs of possible violence and neglect in order to establish the etiologic agent, and (2) the application of some working principles of treatment for some of the common fractures and some of the serious fractures incurred at play and especially in motor accidents.

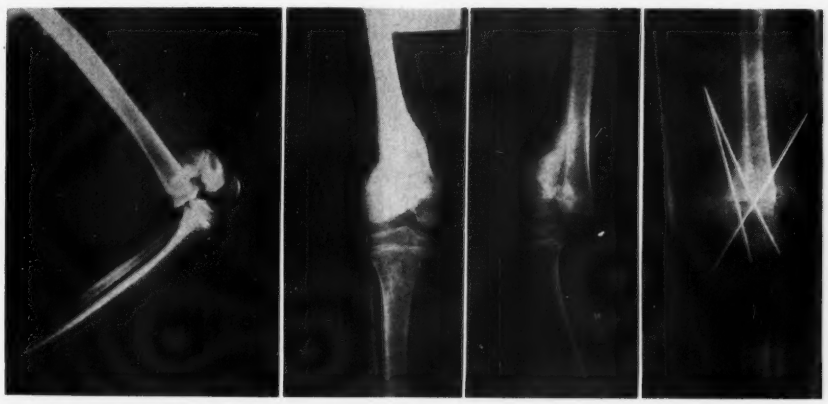
The first part of this presentation is a plea for more widespread and intensive social, as well as medical responsibility for preventing further injuries suggestive of adult assaults in cases that come to the physician's attention. In order to alleviate the situation, the only logical constructive corollary to recognition of the cause of injury, is probing elicitation of the history both to establish the diagnosis and for the social and personal welfare of the child. Significant medical reports touching this subject are briefly incorporated. Four illustrative cases of parental assault are presented—primarily from the sociologic aspect. Two additional illustrations without reports represent parental neglect and assault.

Regarding the second part of this paper, the intention was to present a few practical principles, which are applicable to everyday treatment, not to present an exhaustive technical review of all types of fractures among children.

1. A paramount need to keep in mind is the vascular supply of infants and small children which may be so disturbed in the presence of fracture of a lower extremity as to produce aseptic necrosis and irregularity of growth from epiphyseal arrest. Neglect of compression fractures of the feet may lead to gangrene and even to the necessity for amputation.

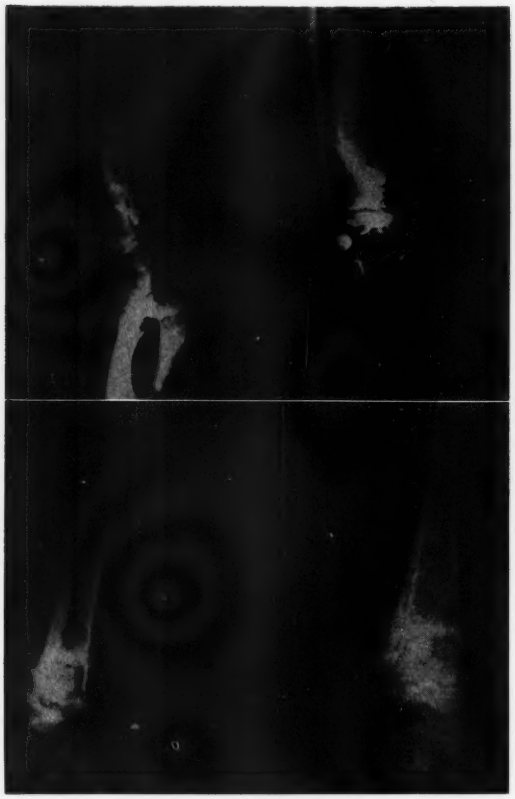


Fig. 19. Fracture of capitellum. Requires open reduction and replacement with screw or pins.



Figs. 20 and 21. Epiphyseal separation with a portion of diaphysis. Closed reduction failed; open reduction with pin fixation necessary.

2. Open reduction is performed only under exceptional conditions, such as olecranon fractures with separation; patellar fractures with separation; the rare pelvic fracture with symphysis pubis



Figs. 22 and 23. What not to do: Application of screw plate in a youth, aged fourteen years. Fig. 22 *(above)*. Plate inserted near wrist. Fig. 23 *(below)*. Epiphyseal separation of lower portion of femur. Wiring seen *in situ*. This surgical procedure to be avoided.

separation; when the neck of the femur has been fractured; when fragments must be reduced in and about the knee joint or for fracture of a single condyle of the femur when the fragments have been displaced and cannot be reduced by manipulation or traction. Plating of the child fracture is usually contraindicated.

3. Washing and irrigating for débridement do not mean removing and destroying.

4. In the developing epiphyses of children, given time, after the initial reduction by the physician, self-correction may be anticipated; overmanipulation invites complications. It is the clinical condition of the child and his joint that should be treated, not the roentgenographic appearance of that joint. The roentgenograms are taken to follow the course of angulated or rotated fractures

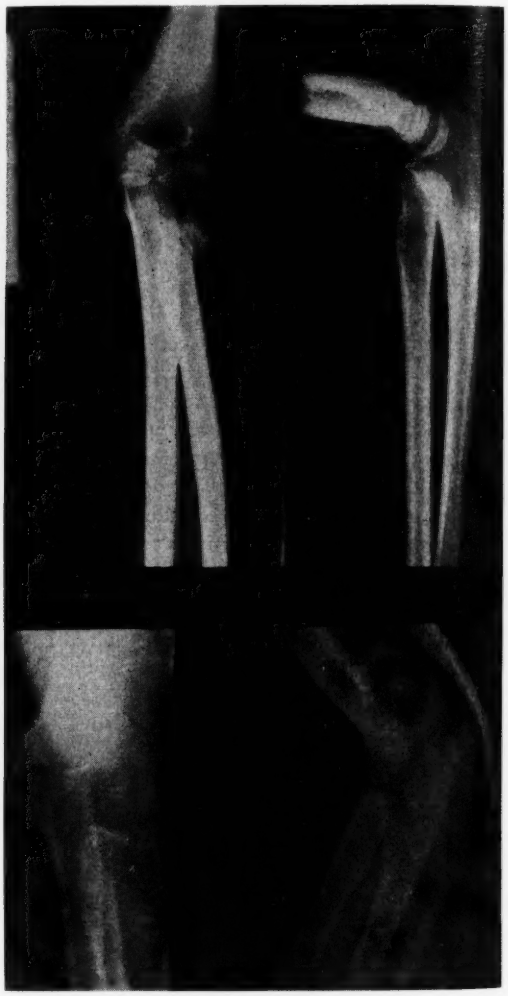
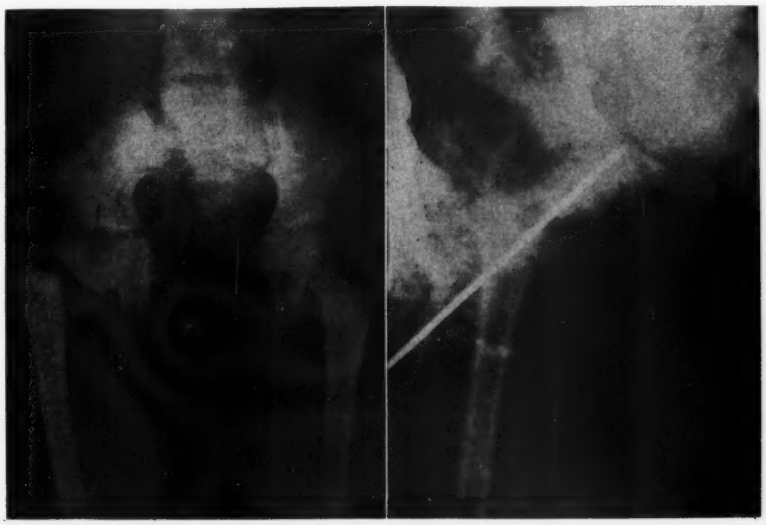


Fig. 24. Fracture dislocation of head of radius. Open reduction necessary to correct displacement of head of radius.

and those fractures that have produced shortening—these must be reduced and may not be left to time and natural repair.

5. The child who is old enough to understand should be told about the fracture and reassured about what is to be done, including reassurance about preoperative medication by injection. By gentle approach, the child will understand the prerequisites and will cooperate.

6. Orthopedic examination is not complete without review and care of the vascular and neurologic systems nor is it complete without painstaking and probing history-taking, particularly in the presence of multiple injuries suggesting parental assault, including bruises and hematomas—besides fractures.



Figs. 25 and 26. Trans-cervical fracture of neck of femur in mongoloid child, aged seven years. Neglect injury (not reported in text). Treated by pin fixation (a_1).

7. Hidden or occult fractures must not be overlooked; they may be disclosed by later rather than by the immediate bilateral roentgenograms. These often substantiate the supposition of parental assault by showing healed fractures in addition to revealing fractures not immediately apparent.

8. Preparation of the emergent patient must not be done in haste to correct the fracture when an anesthetic is necessary. It is far better to delay reduction if the stomach is full; otherwise, regurgitation, lung abscess, sepsis, and death may be consequent.

9. Salient points to remember in the treatment of common fractures are these: (a) avoid rotation and angulation; (b) correct alignment; (c) avoid tight bandages and pressure; (d) be watchful of the circulation; to that end, leave the toes exposed when applying a cast in order to observe the color; (e) be reminded that surgical intervention is not necessary unless the fragments show sequestration by the primary injury or because of the myodynamics; for example, of the olecranon or of the condyles of the elbow or knee.

10. Because orthopedic problems are often emergencies, surely for the welfare of the patient but practically for self-protection against malpractice suits, a thorough and detailed history should be carefully filed in the hospital records.

References

1. Caffey, J.: Multiple fractures in long bones of infants suffering from chronic subdural hematoma. Am. J. Roentgenol., 56:163, 1946.
2. Silverman, F. N.: Roentgen manifestations of unrecognized skeletal trauma in infants. Am. J. Roentgenol., 69:413, 1953.
3. Woolley, P. V., Jr., and Evans, W. A., Jr.: Significance of skeletal lesions in infants resembling those of traumatic origin. J.A.M.A., 158:539-543 (June 18) 1955.
4. Astley, R.: Multiple metaphyseal fractures in small children (metaphyseal fragility of bone). Brit. J. Radiol., 26:577, 1953.
5. Bakwin, Harry: Multiple skeletal lesions in young children due to trauma. J. Pediat., 49:7-16 (July) 1956.
6. Jones, H. H., and Davis, J. H.: Multiple traumatic lesions of the infant skeleton. Stanford M. Bull., 15:259-273 (Aug.) 1957.
7. Friedman, M. S.: Traumatic periostitis in infants and children. J.A.M.A., 166:1840-1845 (April 12) 1958.

Diabetic Acidosis

Have you seen a patient in coma lately? This article discusses the recent practical applications of mechanisms concerned in diabetic acidosis which must always be considered in the diagnosis in patients with coma. The significant signs for differential diagnosis and an outline of systematic treatment are conveniently illustrated in the figures.

WITH the advent of improved surgical and medical care, antibiotics and an increasing awareness on the part of both doctor and patient of the need for early treatment of diabetic complications, the number of cases of diabetic acidosis and coma has decreased markedly. When a disease is not seen frequently, the details of its treatment tend to be forgotten. For this reason, it is felt that it will be worthwhile to review the current concepts of the pathologic physiology and therapy of diabetic acidosis and coma.

Diabetic acidosis and coma is a medical emergency of major degree and recovery depends upon its early recognition and aggressive treatment. It is due to a decreased ability of the body to utilize glucose. When the utilization of glucose falls below a certain level, there is an increase in the metabolism of fat. In situations in which the general rate of metabolism is increased, such as pregnancy, infection and surgery, increased metabolism of fat occurs at a higher level of glucose utilization than when the metabolic state is normal. It is, therefore, much easier for diabetic acidosis to occur in those conditions. As a result of the increased fat metabolism, organic acids called ketone or acetone bodies accumulate faster than the body is able to complete their oxidation. In the early stages, the kidneys, and to a lesser extent the lungs, are able to excrete the excess acetone bodies of the blood. Eventually the acetone bodies are produced at a rate which exceeds the body's ability to dispose of them. Diabetic acidosis is, then, a chemical intoxication coupled with secondary effects of water and electrolyte imbalance. Hyperglycuria produces its marked diuretic effect; each gram of glucose lost in the urine carries with it approximately 20 c.c. of water. Large amounts of base are needed to neutralize the acetone bodies being excreted in the urine. The readily available sodium ion and smaller but important amounts of potassium are used by the body for this purpose. As sodium is excreted in the urine, the CO_2 that was combined with it as HCO_3 is freed and excreted by the lungs through increased depth and rapidity of respiration. This ultimately results in lowered plasma CO_2. Large amounts of chloride are lost as salt through the urine in the polyuria that results from the glycosuria. These changes result in the dehydration and electrolyte imbalance that characterizes the acidotic state. If they continue uninterrupted, falling blood pressure, vascular collapse and eventually renal failure occur. Changes in the tubules characteristic of lower nephron nephrosis may occur. Once this pathologic lesion has occurred, treatment with large amounts of fluid is extremely hazardous.

TABLE I. DIAGNOSIS

Plasma Co_2	Stage	Symptoms & Signs	Recognition
23 mEq.	Mild acidosis	Vary from NONE to; polyuria, polydypsia, acetone breath. Increased glycosuria and ketonuria.	Test urine for sugar and ketone bodies. Blood sugar and CO_2 changes.
15 mEq.	Severe	Lack of appetite, nausea, vomiting, abd. pain.	Symptoms plus laboratory findings.
9 mEq.		—DYSPNEA—	
4 mEq.	Pre-coma to coma	Kussmaul breathing; stupor Circulatory collapse; death	Symptoms plus laboratory findings.
0			

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Symptoms and Signs

It is simplest to divide diabetic acidosis into a mild and a severe stage from the standpoint of both diagnosis and treatment. A significant degree of acidosis may occur without symptoms.

Mild Acidosis—Recognition in this relatively symptom-free stage of acidosis depends largely on testing of the urine for glycosuria and ketone bodies and upon chemical analysis of the blood. There may be mild polyuria and polydypsia coupled with moderate dehydration. The plasma CO_2 is usually above 15 MEq. When recognized as being in this early stage of acidosis, the diabetic can be easily and simply restored to normalcy by simple hydration and regulation of insulin dosage.

Severe Acidosis.—When the plasma CO_2 falls below 13 to 15 MEq., unmistakable signs and symptoms begin to appear. Frequently the stage of severe acidosis is ushered in by digestive disturbances such as anorexia, nausea and vomiting. Pain often accompanies the nausea and vomiting. The pain is most commonly in the abdomen and may be colicky. It is usually accompanied by leukocytosis and low grade fever. A guarded or rigid abdomen may be present and cause confusion in diagnosis with appendicitis, peritonitis, gall bladder or ureteral colic. The pain may originate in or radiate to the chest and when accompanied by Kussmal respiration, appear sufficiently like pneumonia to cause confusion.

Kussmal breathing ushers in the true precoma phase of acidosis. It occurs when the CO_2 reaches a level of about 9 MEq. It is usually followed shortly by drowsiness and, as the CO_2 level of the plasma continues to fall, by coma. Kussmal respiration represents an extreme danger sign and demands aggressive treatment.

As the plasma CO_2 continues to fall and reaches a level of 4 to 5 MEq., general collapse results. Blood pressure falls, a weak thready pulse occurs, respiration becomes more and more shallow, urine output decreases and death occurs.

Differential Diagnosis

The known diabetic receiving insulin who is seen in an unconscious state may present a difficult differentiation between diabetic coma and insulin reaction. The giving of additional insulin to a patient already in hypoglycemia, or the withholding of insulin from a patient in diabetic coma, may lead to a fatal outcome. Diabetic coma comes on gradually over a period of days or hours whereas an insulin reaction is manifest in a much shorter interval. It must be remembered, however, that

reactions due to protamine zinc insulin may be very gradual in onset. The following signs usually

TABLE II. DIFFERENTIAL DIAGNOSIS

	Diabetic Coma	Insulin Reaction
1. Onset	Slow	Sudden
2. Thirst	+	−
3. Hunger	−	+
4. Vomiting	Common	Seldom
5. Pain in abd.	−	+
6. Skin	Dry—florid	Moist—pale
7. Eyeballs	Soft	Normal
8. Respiration	Air—hunger	Normal
9. Glycosuria	+	Absent (check 2nd spec.)
10. Ketone bodies	+	−!

suffice to differentiate between the two.

When faced with the problem of unconsciousness in a diabetic patient under conditions in which laboratory studies are impossible to obtain, one is always justified in giving a small amount of concentrated glucose solution intravenously in order to help rule out an insulin reaction.

The similarity between the acute abdomen and diabetic acidosis has already been mentioned.

A cerebrovascular accident may present a picture similar to diabetic acidosis and create an especially difficult differential diagnosis in a known diabetic. Strong evidence in favor of a vascular accident, either in a diabetic or a non-diabetic, is the presence of neurologic abnormality such as asymmetrical changes in the reflexes, localized muscular weakness or evidence of cranial nerve involvement.

An alcoholic in coma may occasionally present a problem in differential diagnosis and without an adequate history, laboratory studies may be essential in making the diagnosis.

Uremia may be associated with severe dehydration and ketonuria but rarely glycosuria. The CO_2 combining power is frequently reduced, but the blood sugar level is not elevated. Since diabetics in late stages of the disease may develop uremia, the coexistence of the two conditions must be considered.

Treatment

Diabetic acidosis and coma must be considered as an emergency of the first order. A source of infection must be searched for since it is often a precipitating factor. As soon as the diagnosis has been established, large doses of regular (crystalline) insulin should be given. There should be no hesitancy in giving enough insulin to achieve the desired result. In general the initial dose of insulin can be gauged as follows. If the blood sugar is over 600 mgm. per cent, 100 units of regular insulin may be given intravenously and up to an additional 100 units of regular insulin should be given subcutaneously depending upon the severity of the acidosis. If the blood sugar is between 400 and 600 mgm. per cent, 50 to 75 units of regular insulin can be given intravenously and 50 to 75 units subcutaneously. With a blood sugar of 300 to 400 mgm. per cent, 25 units of regular insulin may be given intravenously and 25 to 50 units subcutaneously. Forty units of regular insulin subcutaneously will usually be adequate if the blood sugar is below 300 mgm. per cent provided that severe acidosis is not present. It should be remembered that any given dose of insulin will be less effective in the presence of severe acidosis.

TABLE III. TREATMENT

Fasting Blood Sugar Levels	Initial Insulin Dosage Given as Units of Crystalline (Regular) Insulin
1. Over 600 mgm %	1. 100u. I.V. plus .100u. subq. if patient is in severe acidosis.
2. 400 to 600 mgm %	2. 50 to 75u. I.V. plus 50 to 75u. subq.
3. 300 to 400 mgm %	3. 25u. I.V. plus 25 to 50u. subq.
4. Below 300 mgm %	4. 40u. subq.

In one to two hours re-evaluate the patient and give insulin accordingly. In severe acidosis may need 100 to 200u. every hour.

After administration of the initial insulin and other measures to be mentioned later, the patient must be kept under close observation. Antibiotics should be administered if needed. A diabetic coma sheet showing the blood sugar and other chemistries, insulin given, fluids given, hourly urine sugar tests and urine output should be kept. Much confusion in treatment will be avoided if this is done. Intravenous fluids should be started and a blood sample drawn for determination of CO_2,Cl and urea. A catheter should be inserted and the stomach lavaged if necessary. It is well to get an electrocardiogram for comparison with later tracings since the question of hypopotassemia will arise.

Thereafter, hourly urine sugars should be done and the dosage of insulin adjusted accordingly. Thirty units of regular insulin may be given for a 4 plus sugar, 25 units for 3 plus, 20 units for 2 plus, and 10 units for a 1 plus sugar. Larger doses from 100 to 200 units of regular insulin may be needed per hour in the presence of severe acidosis. The exact dose must, of course, be individualized. Blood sugar, CO_2 and Cl should be

done every three to four hours until the patient is out of danger.

I do not favor the use of any insulin except regular (crystalline) insulin during the first 24 to 48 hours of therapy since insulin with delayed action is too slow to intervene actively in the early treatment and may predispose the patient to severe hypoglycemic reactions during the next twenty-four to thirty-six hours.

Fluid Therapy

The need for proper fluid replacement in the diabetic in acidosis is as great as the need for insulin. It must be remembered that there are several coexistent problems.

Dehydration.—The adult acidotic patient will require between 3000 and 8000 c.c. of fluid in the first twenty-four hours of therapy. The solution should be given as rapidly as the circulatory state of the patient will permit.

Acidosis.—The readily available base of the body has been excreted in the urine in an attempt to neutralize the ketone bodies. The basic need then is for sodium. Most patients can be treated adequately with isotonic saline if the renal function is adequate. The state of renal function should be born in mind since the ratio of sodium to chloride in the plasma is 3 to 2 and not 1 to 1 as it is in isotonic saline. With an adequately functioning renal mechanism, the needed sodium will be retained and the excess chloride excreted. Since this mechanism cannot always be relied upon in the elderly patient or in the diabetic with arteriosclerosis, it may be necessary to supply needed base in the form of molar sodium lactate (two ampules of 40 c.c. each containing 40 MEq. of sodium lactate may be added to a liter of isotonic saline). However, in severe acidosis, the body is relatively unresponsive to insulin and may be unable to catabolize the lactate at a rapid enough rate to make the sodium available as rapidly as needed. In this situation, 500 c.c. of 5 per cent sodium bicarbonate solution intravenously may be lifesaving.

Potassium depletion.—There is marked withdrawal of K^+ from the serum as improvement in the acidosis occurs. The increased utilization of glucose and repletion of intracellular potassium may cause severe hypopotassemia. This may occur as early as four hours after the beginning of therapy. The earliest evidences of decreased serum potassium are found in lowered and inverted T waves in the electrocardiogram. It is well to repeat leads 1 and 2 of the electrocardiogram at four, eight, twelve and twenty-four hours after therapy has been started. Marked muscular weakness is a later symptom and the situation should be noted on the electrocardiogram before this occurs. When potassium is needed, 40 MEq. of potassium phosphate may be given per hour. However, before K^+ is administered, the patient's renal status must be judged by urinalysis, BUN and urine output, since serious potassium toxicity may occur if renal insufficiency is present. In this situation, potassium should be administered with great caution if at all.

TABLE IV. TREATMENT—FLUIDS

1. 1500 to 2000 cc. normal saline I.V. stat. 3000 to 8000 cc. may be needed in 24 hours.
2. Precautions as to circulatory state and ability of the kidney to handle the fluids given.
3. May need 5% $NaHCO_3$ if in severe acidosis.
4. Potassium—determine need by E.K.G. or laboratory test. When needed may give 40mEq. of potassium phosphate per hour. Watch patients' renal status carefully.
5. Order blood sugar, CO_2, Cl, Urea, Catheter, Gavage.

Whether or not to use I.V. glucose solutions is I believe an individual matter which can be decided only after observing how rapidly the blood sugar is being reduced. Early and injudicious use of I.V. glucose often confuses the laboratory and clinical picture and makes it difficult to determine subsequent insulin dosage. I personally do not advocate the use of intravenous glucose until the acidosis is under control and the blood sugar near normal.

After Care

When the urine is free of acetone and the glycosuria is 2 plus or less, the acute phase of the illness may be considered over. During the next twenty-four hours the patient should be on a liquid to soft diet and insulin dosage determined by the amount of glycosuria. It is usually possible to re-establish the standard diabetic program within forty-eight hours.

Summary

Diabetic acidosis and coma, their differential diagnosis and treatment have been reviewed. Early and aggressive treatment may be lifesaving in this medical emergency.

MM

Ocular Palsy in Temporal Arteritis

Medical Progress

Part II

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WHILE preparing this report on oculomotor disturbances, the author found that the literature contained no comprehensive account of the more general central nervous system manifestations of temporal arteritis which, when added to the visual and ocular signs, might serve to complete the neurologic part of the clinical picture.

Therefore, a review of all the reported cases of temporal arteritis with cerebral complications was undertaken; this, however, appeared to be of limited value when confined to a single form of arteritis. It was then decided to expand the review to include the neurologic features of each of the several arteritides (periarteritis nodosa, granulomatous angiitis, *et cetera*) the whole to be prefaced by a brief outline or classification of the various forms of arteritis. The aim has been to demonstrate the relationship, if any, of temporal arteritis to the other arteritides and at the same time to point out the ways in which it differs from them clinically and pathologically.

The cranial arteritides, whose etiology is more or less understood, have been purposely omitted from the tabulation below, for example, meningovascular syphilis and arteritis secondary to pyogenic and tuberculous meningitis. Schistosomiasis,[26] histoplasmosis,[27] mucor mycosis, torula and other fungi may produce a granulomatous meningitis in which the cerebral blood vessels become involved. Typhus, malaria and trichinosis can also evoke a cerebral arteritis. Nematode infestation has not been reported to involve cranial vessels, although

Part III, the final section of this paper, will follow in a future issue.

incriminated in the etiology of angiitis in other parts of body. Cerebral sarcoidosis will be discussed under the neurologic manifestations of granulomatous angiitis.

The Arteritides—A Classification and Outline

The cause of each of the arteritides remains obscure, although they are commonly regarded as the manifestation of an allergic process. It would, of course, be most important to find a common thread of etiology running through the various types but, on the grounds of clinical and pathologic features, the formulation of a unitary concept is not warranted at present. The following list of the arteritides, although no doubt creating some artificial divisions, may serve to show temporal arteritis in some semblance of its proper perspective within the general field of arteritis.

1. *Periarteritis nodosa* (classical periarteritis) is a focal necrotizing process involving medium-sized and small muscular-type arteries of many viscera. The lesions are related to bifurcations and are of various ages. An important distinguishing feature of this type is its tendency to spare the pulmonary vascular tree; moreover there are no lesions in the splenic arterioles or in non-vascular collagenous tissue. The inflammatory infiltration usually does not contain giant cells. The lesions may be visible only microscopically and for that reason the term "nodosa" is not wholly appropriate. Asthma and eosinophilia do not occur clinically.[28]

2. *Allergic granulomatous angiitis with asthma and eosinophilia* (Churg and Strauss)[29] (granulomatous angiitis) consists of widespread necrotizing vascular lesions of the type seen in periarteritis nodosa, and, in this variant, the lungs are characteristically involved. A typical tissue alteration is found in the walls of affected vessels and in the non-vascular collagen system, consisting of a severe fibrinoid change, granulomatous proliferation of epithelioid and giant cells and, at times, necrosis of eosinophilic exudate. The clinical syndrome includes severe asthma, fever, eosinophilia and vascular embarrassment in various organs. This variety is to be distinguished from Group 1 by the presence of giant cells, the involvement of the pulmonary vasculature, the presence of extravascular lesions and the clinical occurrence of asthma and eosinophilia; it differs from Group 3 in the presence of giant cells and the occurrence of asthma and hypereosinophilia.

3. *Hypersensitivity angiitis* (Zeek)[28] is characterized by an acute fibrinoid necrosis of small vessels (small arteries, arterioles and venules) without a predilection for localization at bifurcations. The inflammation may involve the pulmonary vessels and splenic trabeculae, and small foci of necrosis may be found in non-vascular collagen. Giant cells are not seen. Lesions are rare in the intestine. The lesions are microscopic as a rule, tend to be of the same age and granulation tissue is not found around the involved vessels. This type is particularly related to drug and serum reactions.

4. *Wegener's granulomatosis,*[30] a rare disease closely allied to periarteritis nodosa, is characterized especially by necrotizing granulomatous lesions of the upper air passages and lungs. In addition, a generalized necrotizing vasculitis of arteries and veins is more or less widely disseminated, the lungs almost always being involved. These lesions show the classic changes of periarteritis nodosa. A glomerulitis is regularly found, as well as disseminated visceral granulomata, splenic trabeculitis, and massive multiple necroses in the spleen associated with an extensive central arteritis. The clinical picture consists of chronic suppurative sinusitis, ulcerative lesions of the mucosa of the mouth and larynx, cough and dyspnea, otitis media, arthritis and evidence of severe renal damage and failure. It is possible that Wegener's granulomatosis is merely a special form of granulomatous angiitis in which lesions of the upper respiratory tract are unusually prominent. In none of the reported cases (some thirty in all) have intracranial lesions been described.

5. *Unclassified Periarteritis,* as a group, provides a temporary location for the not uncommon cases that cannot be easily arranged within the confines of the first four groups. Usually the atypical features appear to be minor; sometimes giant cells are present when not anticipated, or vice versa; or asthma and/or eosinophilia is missing when the remainder of the picture calls for its presence. It is not unlikely that as knowledge accumulates, regrouping will become necessary.

Rose and Spencer,[31] (1957) finding difficulty in fitting their 111 cases into the above groups, simply classified them into two groups, chiefly according

to whether or not the lungs were involved. The group with involvement of the lung was different from the group without involvement of the lung in the following respects: a respiratory illness preceded the polyarteritis, a blood eosinophilia of 1500 per cu. mm. or more was present and nasal or middle ear granulomas occurred; pathologically, the differences included the occurrence of pulmonary arteritis, necrotizing pulmonary lesions and a granulomatous polyarteritis; the necrotizing or granulomatous lesions were often not demonstrably related to arteries; numerous eosinophils were contained in the arteritic lesions and giant cells were found in the exudate.

6. *Temporal arteritis* (cranial arteritis). Although it is now appreciated that in temporal arteritis many other large arteries of the body are involved—internal carotid, external carotid, common carotid, innominate, subclavian, aortic arch, pulmonary, coronary, thoracic and lumbar aorta, splenic, celiac, renal, mesenteric, iliac, and femoral —the present terminology might well be retained with advantage for the time being because of precedence and custom and because it connotes the approximate site of the most important *clinical* features of the illness, namely headache and blindness. The fundamental lesion is a mildly destructive inflammatory process involving the arteries just listed; lymphocytes, plasma cells, macrophages and polymorphonuclear leukocytes are found throughout the thickened vascular wall but especially in the media and giant cells are characteristically present. Subintimal proliferation of connective tissue narrows the lumen and thrombosis is occasionally added. Vascular nodules and aneurysms are usually not found. Many external cranial vessels other than the temporal and occipital arteries are affected. Allergy and hypersensitivity play no overt part in the etiology of the disease. Almost all patients are elderly. The disease differs from periarteritis nodosa in that the latter involves only small vessels and scarcely ever the temporal arteries, and in this regard cases which would form a bridging link between these two forms of arteritis are extremely rare. On the other hand, cases in elderly persons have been reported in which the aorta and its branches showed a giant cell arteritis when the temporal arteries were apparently spared, suggesting a relationship with idiopathic arteritis of the aortic arch and its branches (Group 7). The term "giant-cell arteritis" has been suggested as more suitable than temporal arteritis but not all cases coming to autopsy have shown giant cells in the vascular inflammation.

7. *Idiopathic arteritis of the aortic arch and its branches* (Takayasu's disease,[32] aortic-arch syndrome, pulseless disease). Although the arteritic lesions in this condition are more widespread than the name indicates, the term has the merit of focusing attention on the site of the most striking clinical effects, namely, the aortic arch and the carotid and subclavian arteries. The disease, a relatively rare entity, is characterized by a mildly destructive chronic inflammation of the stated vessels, the lesions showing macrophages and lymphocytes, and usually giant cells as well. The lumen of the arteries becomes occluded by subintimal connective tissue proliferation, or by organizing thrombus. The thoracic aorta, coronary ostia, and axillary vessels may also be involved. Several authors have concluded that tuberculosis or syphilis has been responsible in their patients and these diseases must always be excluded.

Giant cell inflammation of the aorta and its large branches forms such a striking and integral feature of both Takayasu's disease and temporal arteritis that one might anticipate that a close relationship existed between the two. However, there are equally prominent dissimiliarities: the former affects the elderly, while the latter almost always occurs in women under the age of thirty-five; temporal arteritis has never been reported to produce the aortic arch syndrome which is the principal feature of Takayasu's disease; idiopathic arteritis of the aortic arch and its branches has never been shown to involve the temporal artery; and, whereas the visceral and lower limb arteries have not been the site of arteritis in Takayasu's disease, they have usually been involved in the cases of temporal arteritis studied pathologically. Possibly the two forms of arteritis are closely related, one affecting the young and the other the elderly, a "juvenile" and "senile" arteritis, with *age* accounting for the pathologic and clinical differences.

8. *Rheumatic arteritis* is an acute inflammation of the small arteries, usually of heart and lung, occurring in fulminant rheumatic fever and carditis. Usually the patient is young and the clinical picture is predominantly cardiopulmonary.

9. *Thromboangiitis obliterans* (Buerger's disease). With the advent of further knowledge of

the behavior of atherosclerosis in the aorta and lower limbs, the frequency with which Buerger's disease is diagnosed has fallen correspondingly. A recent review of the literature[33] shows that an actual arteritis (in the usual sense of the term) has never been demonstrated in thromboangiitis obliterans and, therefore, the existence of a specific disease entity, thromboangiitis obliterans remains to be demonstrated. In none of the reported cases of *cerebral* thromboangiitis obliterans has inflammation of the cerebral arteries been found. In several instances, brain infarction has resulted from (or at least been associated with) unrecognized occlusion of the internal carotid artery. The "white vessels" over the area of softening appear to result from stagnation or stasis thrombosis with subsequent organization of the clot. When carotid angiitis is found in the vessels in the neck, temporal arteritis or Takayasu's disease should be considered. The diagnosis of cerebral thromboangiitis obliterans should probably not be made until its clinical, pathologic and etiologic aspects are clarified. Neither temporal arteritis nor idiopathic arteritis of the aortic arch and its branches has been reported to involve the lower limb arteries to a degree sufficient to produce ischemic manifestations but giant-cell arteritis of the femoral artery has been found in the amputated lower limb of a patient suspected of having a more generalized arteritis.[34]

Localized Carotid Arteritis

From time to time, a localized form of carotid arteritis is attributed to inflammatory involvement of the vessel as it passes through the cavernous sinus. For example, Kissel and co-workers[35] described the case of a man, aged thirty-two, who suddenly developed a right hemiplegia and aphasia three weeks after a "grippe-like" febrile illness. Death occurred two days later and at autopsy the left internal carotid artery and its terminal branches were distended and occluded by recent thrombus. Microscopically, the walls of the internal carotid artery (especially the segment within the cavernous sinus) were disorganized, and the elastic lamina was destroyed. The adventitia showed an infiltration of round cells and the authors concluded that the primary lesion was an arteritis originating in the cavernous sinus which caused thrombosis to extend distally and proximally along the internal carotid artery. The pathologic description is brief and the photographs are not clear and one might hesitate to accept the author's interpretation of the illness. Tolosa's case[36] was most unusual. A man, aged forty-seven, for one month had left orbital pain associated with involvement of the third, fourth, fifth and sixth nerves. An arteriogram showed narrowing at the carotid siphon for which surgical exploration was carried out, followed by death. The internal carotid artery within the cavernous sinus showed a cuff of granulation tissue which resulted in narrowing of the lumen without occlusion.

Cope and Jones[37] reported a case in which a left hemiplegia developed about five weeks after right ophthalmic herpes zoster. After discussing the only three previously reported cases of a similar nature, the authors inclined to the view that the hemiplegia was due to the virus invading the nearby pyramidal tract from the trigeminal ganglion. The possibility should be considered in these cases that carotid arteritis had developed secondary to the ganglionitis, resulting in carotid thrombosis or embolism.

Neurologic Manifestations of Temporal Arteritis

(Excluding visual and oculomotor disturbances)

Unfortunately, in many of the reported cases, the neurologic information is so brief that a clear picture of the patient's condition is precluded. Detailed neuropathologic reports are few, and often incomplete, insofar as they fail to draw a satisfactory clinico-pathologic correlation or explain the mechanism by which the brain damage arose. The group of pathologically-studied cases will be summarized first, and second, the cases in which only the clinical findings were available. In the clinical description of each case, only the neurologic data will be presented and it should be remembered that the patient usually showed the typical picture of temporal arteritis as well as the manifestations of nervous system involvement. Because visual disturbances resulting from involvement of the optic nerve have been reviewed on several occasions by other authors, they have largely been omitted here.

In Gilmour's[23] (1941) Case 2, the patient developed a flaccid left hemiplegia eight days before death. The internal carotid stems (from the clinoid process to the bifurcation) were greatly thickened. The walls showed a diffuse inflammatory infiltration with monocytes and giant cells, and

the lumens were occluded by thrombus. The state of the other major branches of the circle of Willis was not mentioned. The temporal arteries were not examined, but clinically the patient had severe pain in the left side of the head.

In Gilmour's Case 3, the patient complained of pain in the neck and temples, vertigo, tinnitus, and later the left arm became weak. The cerebrospinal fluid contained 360 mg. of protein and 650 white cells per cu. mm., chiefly lymphocytes. The walls of the internal carotid arteries in the region of the clinoid processes were greatly thickened and the lumens were occluded by thrombus. Microscopically, the changes were the same as in Case 2. The temporal arteries were not examined. There was a cerebral infarct and, in addition, numerous areas of hemorrhage throughout pons and midbrain. It might be assumed that in this case tentorial herniation had complicated the cerebral infarction.

Cooke et al[6] described two patients with cerebral manifestations. Patient 3 had been temporarily irrational and disoriented at the height of her illness, and at autopsy there were cerebral softenings and many of the smaller vessels contained antemortem thrombi, either embolic or thrombotic. The walls of the cerebral arteries were free of inflammation. Patient 6 developed severe giddiness, nausea and vomiting ten days after admission. Three days later, it was noted that the patient was totally deaf in the left ear and partially deaf in the right. For the next seven days she was irrational and incontinent of bladder and bowel. Her condition then improved and hearing returned so that she could hear the normal voice at 2 feet in either ear. Orientation was temporarily regained but two weeks later the patient died in coma (not further described). In the brain, tiny softenings were common in the subcortical white matter and the related vessels showed thrombosis. Some of the thrombi contained many polymorphonuclear leukocytes but there was no evidence of any inflammatory reaction around the vessels. The nature of the cerebrovascular disease was not fully explained.

Cardell and Hanley's[11] patient had typical temporal arteritis. The later part of his illness was marked by right frontal headache, vertigo, dysphagia and dysarthria, weakness of the right facial muscles, nystagmus, and right palatal palsy. At autopsy, there was giant cell arteritis of both internal carotid arteries in the region of the origin of the ophthalmic artery but the lumen of the vessels was patent. There was no inflammation of any of the other major cerebral vessels and the cause of the neurologic symptoms was not found.

Ritama's[24] (1951) case was one of a woman, aged sixty-three, who after ten years of deforming arthritis developed dyspnea on effort, dizziness and headache. One week after admission to the hospital an "apoplectiform fit" occurred. The patient vomited, speech became slurred and the left hand was helpless. These symptoms cleared in twenty-four hours. A Babinski sign was present bilaterally. The blood pressure was as high as 200/120. Having been somnolent and disoriented for some days, the patient died seven weeks after admission. Pathologic examination showed a giant cell arteritis involving both internal carotids, the common carotids, the thoracic aorta, the coronary arteries and the "cranial arteries" of different size. The temporal arteries were not examined but the most proximal part of one external carotid artery was affected. The left internal carotid artery was surrounded by abundant soft granulation tissue in the region of the carotid canal. "The brain tissue revealed numerous ischemic necroses particularly involving the cortex. The left posterior inferior cerebellar artery was thrombosed. The hypophysis was disintegrating." The surface of the aorta near the aortic valve cusps was covered with a thin fibrinous thrombus. The pathologic findings justify accepting this case as temporal arteritis in the absence of an examination of the temporal arteries. The carotid arteries were not occluded by thrombus and the cause of the cerebral infarctions was not stated. Cerebral embolism was possible in view of the presence of intimal thrombus near the aortic cusps. Hypertensive atherosclerotic encephalomalacia also might have been a factor although the predominantly cortical location of the softenings would be against this interpretation.

In Case 3 of Meneely and Bigelow[38] (1953), the patient had episodes of sudden loss of consciousness and falling without convulsions. Examination disclosed right wrist drop, slight atrophy of the left foot, and mild right facial weakness. A left carotid arteriogram showed failure of the vascular tree to fill. The patient lapsed into coma and died. Pathologic study showed advanced atherosclerosis of both internal carotid arteries, and, in addition, the changes of granulomatous arteritis with foreign-body giant-cell reaction. The thrombi in both of these vessels had virtually obliterated the already-narrowed lumen and there was wide-

spread encephalomalacia. Several of the small intracerebral vessels showed changes suggestive, but not typical of a granuloma.

In Case 13 of Heptinstall et al.[15] a man, aged sixty-six, was admitted for fatigue, anorexia and temporal headache with more recent drowsiness and weakness. He died in coma three weeks after admission. The blood pressure was 260/140. At autopsy there was an infarct of the right lobe of the cerebellum and occlusion of the right vertebral artery. The temporal and facial arteries also had thickened walls and narrowed lumens. Characteristic arteritic changes were found microscopically in the right and left facial, right vertebral, right occipital and left external carotid arteries as well as in the temporal arteries. In their Case 14, the patient, aged sixty, had sacral pain, pain across the shoulders, loss of weight, tiredness and left-sided headache. During the next three months he had severe pain in both temples with blurring of vision and occasional diplopia. Soon afterwards he became blind in both eyes, then disoriented and developed first a left hemiparesis, then a right hemiplegia with subsequent death in coma. The brain showed extensive softening of both occipital lobes and both vertebral arteries were thrombosed where they entered the skull and thrombus was also present in the posterior cerebral arteries. Microscopically, the following arteries were affected by giant-cell arteritis: aorta, right and left temporals, right internal carotid, right external carotid, right and left common carotids, right and left vertebrals with intravascular thrombosis, right and left ophthalmics, hepatic, right popliteal and right subclavian. The inflammatory changes were frequent in the intima while the media showed fewer lesions. These two cases are of special interest because they are the only reported examples of arteritic involvement of the basilar-vertebral system, the lesions presumably lying intracranially.

McMillan's case[39] (1950) was a man, aged fifty-eight, who died of broncho-pneumonia eight days after the onset of a left hemiparesis. At autopsy, the right cerebral hemisphere was swollen and the right internal carotid and middle cerebral arteries contained thrombus. There was a giant cell arteritis of the aorta and left common iliac artery. Apparently the carotid vessels in the region of the thrombus did not show inflammatory changes and, therefore, the exact cause of the thrombosis could not be stated. The temporal arteries were not examined pathologically and there was no clinical evidence that they were affected; the case is therefore included only because of the typical aortic and iliac lesions. It is conceivable and even likely that the disease "temporal arteritis" occurs without actual involvement of the temporal arteries.

The next four cases illustrate the existence of arteritic lesions in the carotid (and other) vessels without cerebral signs. Barnard's[40] (1935) case was of a man, aged sixty-three, with the typical signs of temporal arteritis. At autopsy, there was a diffuse giant cell arteritis of the cervical portion of the internal carotid arteries and their intracranial portion in the cavernous sinus, and of both coronary arteries. The lumen in each instance was greatly narrowed by subintimal connective tissue proliferation. The intracerebral arteries were not affected. The aorta was not examined. There was a small (1 cm.) hemorrhage in the lenticular nucleus of the brain which had, apparently, not evoked clinical manifestations. The author interpreted the pathologic changes as those of tuberculous arteritis.

In Sproul's[41] (1942) case there was good clinical evidence of temporal arteritis (not pathologically verified) and, at autopsy, histologic study revealed arteritis with giant cells involving the carotid, innominate, subclavian, pulmonary, celiac, mesenteric, renal and iliac arteries.

In Greenfield's[17] case, although there were no neurologic complaints, the internal carotid arteries showed extensive medial destruction with replacement by a granulomatous thickening containing giant cells. On both middle cerebral arteries in the fissure of Sylvius, several small rounded or lentiform granulomas, one of which contained a giant cell, and numerous small foci of lymphocytic infiltrations were present in the *adventitia*. The media and intima showed no infiltrations. The anterior cerebral and anterior choloidal arteries were similarly involved but to a lesser degree. The temporal arteries were not examined. Among the many large vessels involved in Fragenheim's[34] Case 1, the common, internal and external carotids were included, but the patient had no abnormal neurologic signs. This case was unusual in that the giant-cell inflammatory process extended to the small bronchial arteries, the intraglandular thyroid arteries and the small vessels of the skeletal musculature, forming a link between temporal arteritis and granulomatous angiitis.

As already pointed out, in the majority of these cases, a good clinico-pathologic correlation cannot

be achieved. Not only is the clinical picture sometimes not explained by the pathologic findings but also, at times, the vascular abnormality cannot be correlated with the parenchymal lesion. Embolus is not always distinguished from thrombus. The arteritis evokes symptoms by causing vascular occlusion and cerebral infarction, large or small. The vessels become obstructed partly by thrombus formation, chiefly by subintimal thickening. The carotid or basilar-vertebral system may be involved but giant cell inflammatory lesions of arteries lying within the dura appear to be uncommon, the only three examples being those described by Greenfield, Heptinstall et al., and possibly Meneely and Bigelow.

In some fifteen additional cases of temporal arteritis studied only clinically, neurologic symptoms and signs have been recorded; however, the description is sometimes vague or ambiguous, making interpretation impossible. Bain's[42] (1938) patient became disoriented about two weeks after the onset of his illness; recovery was complete. In the case cited by Sprague and MacKenzie[43] (1940) it was reported, "The patient's mental processes, ordinarily quite alert, became very sluggish and some of his friends wondered if he had sustained a slight cerebro-vascular accident." The patient did not recover his quickness of thought and action.

Schafer and Sanders'[44] (1942) patient, at the height of his illness, was delirious and had slurred speech. The patient reported by Post and Sanders[45] (1943) deteriorated mentally six years after having temporal arteritis but no evidence was provided to indicate that the two conditions were related. At the onset of her illness, Curtis'[46] (1946) patient was seized with a whirling sensation accompanied by pain in the back of her head. The illness progressed to the full-blown picture of temporal arteritis and bilateral blindness occurred. Three months from the onset of the disease, the patient developed a left hemiplegia and died five days later. An autopsy was not performed.

In Case 2 of Cohen and Harrison[47] (1948) abduction of the right shoulder was limited and the right deltoid muscle was wasted. Robertson's[48] (1948) Case 1 was that of a man who, four months after the acute phase of temporal arteritis, underwent a surgical operation and postoperatively became confused for several days, but a relationship with the arteritis is by no means certain. In Case 4, a man aged sixty-seven, suspected of temporal arteritis (not biopsy-proved) developed a complete right twelfth cranial nerve palsy. Dick's[8] patient was confused and drowsy but no further details were provided. Cloake[49] (1951) briefly referred to a patient of his who developed signs of myelitis with severe, but rapidly improving, paraplegia and corresponding sensory disturbance.

In Case 1 of Kendall[14] the patient, aged seventy-eight, was at times mildly confused and delirious. In his Case 3, the patient complained of giddiness, nausea and ringing tinnitus and on examination nystagmus and nerve deafness were found. The possibility of a co-incidental Ménières syndrome should be considered here. In Case 7 of Heptinstall et al.[15] the patient was still complaining of headache and dizziness one year after the acute stage of her illness. Meadows[19] briefly referred to a patient who died from carotid artery occlusion and hemiplegia soon after the onset of blindness. Two of his patients had evidence of dementia probably not related to the arteritis.

Recently, the first case of temporal arteritis with cerebral symptoms encountered at the Massachusetts General Hospital was seen in consultation with Dr. W. H. Timberlake.

Case 5.—The patient, aged seventy-six, had severe occipital headache for about three weeks beginning in late October 1957. For several weeks previously there had been malaise, anorexia and loss of weight. The headache which at no time extended anterior to the ears, stopped about November 19 and six days later the patient became totally blind in the left eye, overnight. Three days after this, vision in the right eye was noted to be poor. On examination, there was no vision in the left eye and an extensive lower temporal field defect in the right. The temporal arteries were pulseless but not enlarged, firm or tender. Biopsy of the left superficial temporal artery showed a typical giant-cell arteritis. On Meticorten therapy the patient felt better generally but vision did not improve. Meticorten was discontinued after about five weeks (January 7, 1958) and the patient's course was uneventful until February 27 when his wife reported that the right hand had been transiently limp twice in one day. The patient claimed that on three occasions in the previous four days there had been brief spells in which the right hand shook. On examination, the patient was disoriented for time and place, did not recognize his physician, made a few mistakes in naming objects, was quite unable to do simple arithmetic and had a Babinski sign on the right side. Meticorten was restarted and during the following five weeks despite large doses (up to 150 mg. each day) the patient's course was punctuated by episodes whose nature was not established with certainty: On March 5, he told his wife that his right arm had been weak in the morning; March 8, according to the wife, a slight attack in which legs buckled under him; on same day

while sitting in lounge, weakness of right arm and leg noted and patient babbled incoherent answers for three minutes; March 11, momentary spell of confusion and weakness of the right hand which also shook; March 12, patient "fell stiff" on floor, eyes rolled up, no shaking; electroencephalogram markedly abnormal on left side, anticoagulants started and continued for six days; March 17, brief dizzy spell; March 22, weakness of left leg on walking to bathroom; March 23, right arm flexed rhythmically for several minutes; March 27, right leg collapsed and patient fell, did not become confused, arm not affected; March 29, difficulty finding words. From February 27 to March 27, the patient was more or less disoriented, slightly dysphasic and the visual field defect was found to vary considerably. Neurologic examination was otherwise normal and the patient's course was always afebrile. The carotid pulsations were of normal force. The patient later claimed he "passed out" in his spells. He was discharged April 6 on anticonvulsant medication. There were no further spells but five days later occlusion of the left femoral artery occurred and the foot became gangrenous. The patient remained confused and his condition gradually deteriorated, death taking place eight weeks after discharge from the hospital. A postmortem examination was not made and the role, if any, of atherosclerosis on the production of the complications was never determined.

Comment.—Many of the features of the patient's attacks suggested epileptic seizures but since it was reliably reported that sometimes paralysis of limbs had occurred without any preceding convulsive activity, transient ischemic attacks were also a good possibility. If the vascular occlusion of the lower extremity was caused by arteritis, it represents a most rare event. In Fragenheim's[34] Case 2, the patient developed gangrene of one lower extremity and femoral arteritis was found in the amputated specimen, but there was little or no evidence of a generalized arteritis.

From these assembled reports it would appear that involvement of the central nervous system in temporal arteritis is not uncommon. Delirium and confusion are mentioned most often but whether these symptoms are produced by involvement of the brain by the arteritis or are merely the "nonspecific" effect of a systemic disorder in elderly patients is not clear. Hemiplegia as a result of carotid occlusion is the next most frequent finding, followed closely by signs of involvement of the brain stem or eighth nerve viz. tinnitus, dizziness and deafness, manifestations of temporal arteritis which deserve more attention than they have heretofore received. Generally speaking, it is evident that a more accurate and detailed account of the neurologic manifestations of temporal arteritis is needed.

References

26. Kane, C. A., and Most, H.: Schistosomiasis of the central nervous system. Arch. Neurol. & Psychiat., 59:141, 1948.
27. Schulz, D. M.: Histoplasmosis of the central nervous system. J.A.M.A., 151:549, 1953.
28. Zeek, P. M.: Periarteritis nodosa and other forms of necrotizing angiitis. New England J. Med., 248:764, 1953.
29. Churg, J., and Strauss, L.: Allergic granulomatosis, allergic angiitis and periarteritis nodosa. Am. J. Path., 27:277, 1951.
30. Godman, G. C., and Churg, J.: Wegener's granulomatosis, A.M.A. Arch. Path., 58:533, 1954.
31. Rose, G. A., and Spencer, H.: Polyarteritis nodosa. Quart. J. Med., 26:43, 1957.
32. Shimizu, K., and Sano, K.: (a) Pulseless disease. Paper read before 468th Meeting of Surgical Society in Tokyo, June 18, 1948; (b) Pulseless disease. J. Neuropath. & Clin. Neurol., 1:37, 1951.
33. Fisher, C. M.: Cerebral thromboangiitis obliterans. Medicine, 36:169, 1957.
34. Fragenheim, H.: Zur Frage der Riesenzellarteriitis (mesarteriitis granulomatosa gigantocellularis). Zentralbl. allg. Path., 88:81, 1951.
35. Kissel, P., Rousseaux R., Beau, A., Lepoire, J., and Arnould, G.: Thromboartérite aiguë carotidienne. Rev. neurol., 92:226, 1955.
36. Tolosa, E.: Periarteritic lesions of the carotid siphon with the clinical features of a carotid infraclinoid aneurysm. J. Neurol. Neurosurg. & Psychiat., 17:300, 1954.
37. Cope, S., and Jones, A. T.: Hemiplegia complicating ophthalmic zoster. Lancet, 2:898, 1954.
38. Meneely, J. K., and Bigelow, N. H.: Temporal arteritis. Am. J. Med., 14:46, 1953.
39. McMillan, G. C.: Diffuse granulomatous aortitis with giant cells. Arch. Path., 49:63, 1950.
40. Barnard, W. G.: Tuberculous arteritis. J. Path. & Bact., 40:433, 1935.
41. Sproul, E. E.: A case of "temporal arteritis." New York State J. Med., 42:345, 1942.
42. Bain, C. W. C.: Arteritis of the temporal arteries. Lancet, 1:517, 1938.
43. Sprague, P. H., and MacKenzie, W. C.: A case of temporal arteritis (Horton-Magath syndrome). Canad. M.A.J., 43:562, 1940.
44. Schaefer, C. L., and Sanders, C. E.: Temporal arteritis. Am. Heart J., 24:410, 1942.
45. Post, L. T., and Sanders, C. E.: Temporal arteritis: case report with eye findings. Tr. Am. Ophthal. Soc., 41:241, 1943.
46. Curtis, H. C.: Cranial arteritis. Am. J. Med., 1:437, 1946.
47. Cohen, H., and Harrison, C. V.: Temporal arteritis: a report of three cases. J. Clin. Path., 1:212, 1948.
48. Robertson, K.: Temporal or giant-cell arteritis. Brit. M. J., 2:168, 1948.
49. Cloake, P. C. P.: Discussion on some less common cerebrovascular diseases. Proc. Roy. Soc. Med., 44:847, 1951.

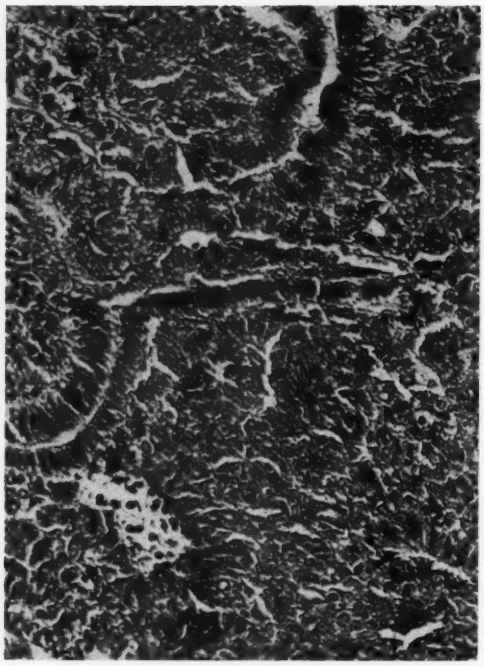


Fig. 2. Grade 1 papillarv adenocarcinoma merging into zones of lesser degrees of differentiation with an alveolar arrangement of cells (hematoxylin and eosin; x200).

Malignant Melanomatous Complex Ovarian Teratoma with Small-Bowel Obstruction

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This case report tells the story of a malignant ovarian teratoma containing melanomatous elements that caused obstruction of the small intestine in an elderly woman. Only half a dozen such lesions have been recorded in medical history.

INTESTINAL obstruction associated with teratocarcinoma of the ovary is a rare clinical entity. The presence of such obstruction was not recorded in an extensive review of the literature by Peterson.[1]

Our report concerns an elderly woman who had a teratocarcinoma of the ovary complicated by obstruction of the small intestine.

Report of Case

A seventy-six-year-old woman was admitted to the hospital in February, 1959. Seven days previously, she had begun to experience cramping lower abdominal pain. This pain increased in severity and was associated with

nausea and vomiting that began forty-eight hours before admission.

The patient had been operated on in 1920 for obstruction of the small intestine caused by adhesions; at this time, 16 cm. of ileum had been removed and continuity had been re-established by end-to-end anastomosis.

On examination, she appeared to be reasonably comfortable and not in acute distress. The abdomen was moderately distended and revealed a lower midline and right lower quadrant scar. The intestinal sounds were present and slightly high-pitched. Peristaltic rushes were not heard. Pelvic examination disclosed a cystic mass about 8 cm. in diameter in the right adnexal region. This was believed to be ovarian in origin. Rectal examination was noncontributory.

A Levin tube was passed for continuous gastric suction, and fluids were given intravenously. She continued to pass small amounts of gas per rectum, and it was thought that she had partial intestinal obstruction.

Hematologic studies gave normal results except for a mild leukocytosis, the count being 11,800 cells per cubic millimeter of blood. The following values in milliequivalents per liter of serum or plasma were obtained: sodium, 109; chloride, 90; potassium, 3.7; carbon dioxide-combining power, 26. The blood urea measured 18 mg. per 100 ml.

Roentgenologic examination showed slight gaseous distention of the colon and probably of some loops of terminal ileum, with evidence of fluid levels.

Proctoscopy disclosed beginning sacculation and two diverticula at the 13-cm. level. At 15 cm., the intestinal lumen was greatly narrowed by sacculation and the wall was fixed, making it impossible to pass the instrument any higher. There was no evidence of a neoplasm, and the mucosa was intact throughout.

The patient received a modified preoperative preparation of the intestine, using neomycin given through the Levin tube, which was clamped after each dose. Enemas were given until the returns were clear. On the fourth day following admission, a secondary lower midline abdominal incision was made, with excision of the old scar. Many adhesions were found when the abdomen was opened. The small intestine was greatly dilated as the result of a loop that was obstructed in the cul-de-sac in relationship to the cystic mass that had been noted clinically. This obstruction was released by blunt dissection. The mass was ovarian and was extremely necrotic as well as cystic. The tumor was considered

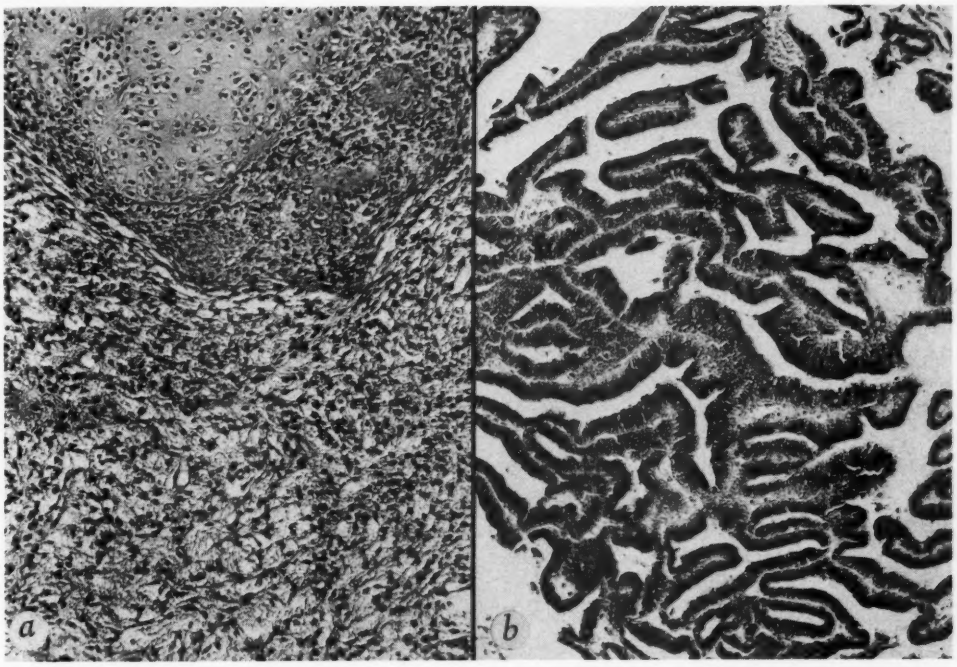


Fig. 1. *a*. Islands of cartilage, as shown here, represent the only benign components of this teratomatous tumor. This particular island lies in a spindle cell sarcomatous matrix. *b*. Low-grade papillary adenocarcinoma comprised the bulk of the tumor. Here, the pattern appears in pure form (both, hematoxylin and eosin; x150).

to be malignant, and the right ovary and adnexa were removed for diagnosis. Histopathologic study disclosed a hemorrhagic, necrotic, grade 4 malignant teratoma. The remaining ovary and the uterus then were removed in the usual fashion. Gross tumor was present on the loop of small intestine that had been obstructed. With the hope of palliation, this segment was removed and an end-to-end anastomosis was made. There was a remaining mass that was retroperitoneal and fixed to the sacrum. Because of the type of tumor and because the procedure would not be curative, this presacral mass was not disturbed.

The patient did well following the operation. During her hospital convalescence, a basal cell epithelioma was removed from her left cheek. She was dismissed with instructions to return in three months to be reevaluated for the possibility of roentgen therapy.

Pathologic Aspects

The gross pathologic material consisted of the uterus, both tubes, both ovaries and a 25-cm. segment of small intestine. Almost completely replacing the right ovary was a predominantly solid, friable, hemorrhagic, necrotic tumor weighing 75 gm. and measuring 8 cm. in diameter. No capsule worthy of the name was present. Over one aspect measuring 4 by 4 cm. was a meaty raw surface representing the zone of attachment to the removed segment of small intestine.

The cut surfaces were remarkable in that they displayed sizable zones in which the color was coal black. The remainder of the tumor was dark tan except for reddish patches of hemorrhage and yellowish zones of necrosis. All portions were extremely friable, and the central core of the tumor was excavated to form a cyst with ragged walls that measured 2.5 cm. in its greatest dimension.

The segment of small intestine was angulated and partially obstructed as a result of adherence to the ovarian tumor. Over its serosal surface, a zone measuring 4 by 4 cm. was deeply invaded by adherent malignant tissue. The atrophic uterus was not remarkable except for the presence of several malignant implants on its posterior surface. The uterine cavity was somewhat distended as a consequence of a small hydrometra, which apparently resulted from the presence of endocervical adhesions. The left ovary was atrophic. The fallopian tubes were normal except for several small tumor implants near the fimbriated end on the right.

Microscopically, the presence of several islands of cellular but benign cartilaginous tissue represented the only benign component in the right ovarian neoplasm (Fig. 1*a*). Chief among the malignant "ingredients" was adenocarcinoma, which varied in its degree of differentiation from grade 1 papillary adenocarcinoma (Fig. 1*b*) to solid sheets of undifferentiated cells (Fig. 2). It was impossible to ascribe a tissue or tissues of origin to this adenocarcinomatous moiety, since normal entodermal elements were not identified within the tumor.

In other broad zones, the neoplastic elements were spindle-shaped, sometimes being in a myxomatous matrix (Fig. 3*a*). Mitotic figures were fairly numerous. In the absence of identifiable cross striations, osteoid material or vascular spaces, it was not possible to designate this sarcomatous portion of the tumor more accurately than to state that it was of the spindle cell type. Admixture of the glandular and spindle cell elements at times produced a picture somewhat reminiscent of embryonal renal adenosarcoma, or Wilms's tumor (Fig. 3*b*).

The third main constituent of the malignant cellular mixture consisted of broad sheets of malignant epithelial cells containing heavy deposits of dark pigment (Fig. 4). The melanoblastic identity of these elements was established by the use of special techniques, including stains for iron. The uterine, tubal and intestinal involvement appeared to result from the processes of direct extension and peritoneal sedimentation. The endocervical obstruction was on an inflammatory basis.

Comment

The incidence of malignant transformation in teratomas varies widely depending on the tissue or organ from which the teratoma takes origin. Thus, ovarian teratomas are benign (dermoids) in perhaps 98 per cent of cases, whereas their testicular counterparts are malignant in a similar incidence. The majority, perhaps 75 per cent, of presacral, retroperitoneal and mediastinal teratomas are benign. However, the midline teratoma of the pineal gland is usually a malignant neoplasm.

Malignant changes originating within a teratoma may take on one of two forms. The first is anaplasia, which is confined to one of its constituent tissues, such as the squamous cell carcinoma that arises from the ectoderm of an ovarian dermoid. In a review of 222 malignant ovarian teratomas, Peterson[1] found that epidermoid carcinoma accounted for 88 per cent of the group, with adenocarcinomas and carcinoids making up the bulk

of the remainder. However, Peterson's analysis concerned itself chiefly with cystic ovarian teratomas that contained benign elements.

The second type of malignant change occurring in these neoplasms is what Willis[2] aptly described as "total malignancy." A complication of the more solid or embryonal or complex teratomas as contrasted with the more simple dermoids, this change features malignant neoplasia of several constituent tissue types, and its origin is from immature embryonic elements rather than from the mature tissue observed in the afore-mentioned category. Testicular teratomas are almost always of this mixed malignant category, and the intermingling in them of choriocarcinomatous, adenocarcinomatous and sarcomatous tissue occasions no surprise.

Thus, the tumor in our patient is an example of "total malignancy" in an embryonal teratoma, with only a small island of embryonic cartilage exhibiting any semblance of orderly growth and maturity. We have observed less than a dozen examples of such lesions in a study of more than 4000 cystic and solid ovarian neoplasms, which included more than 500 "dermoids." This tumor represented our first encounter with a primary ovarian teratoma containing malignant melanomatous elements. Otken[3] likewise attested to the rarity of primary ovarian melanoma, citing only seven comparable cases, some of them poorly documented. Peterson referred to a case that was mentioned in a personal communication from Teilum.[4] Other isolated examples may have eluded us in our review, but it would appear that the condition is indeed rare.

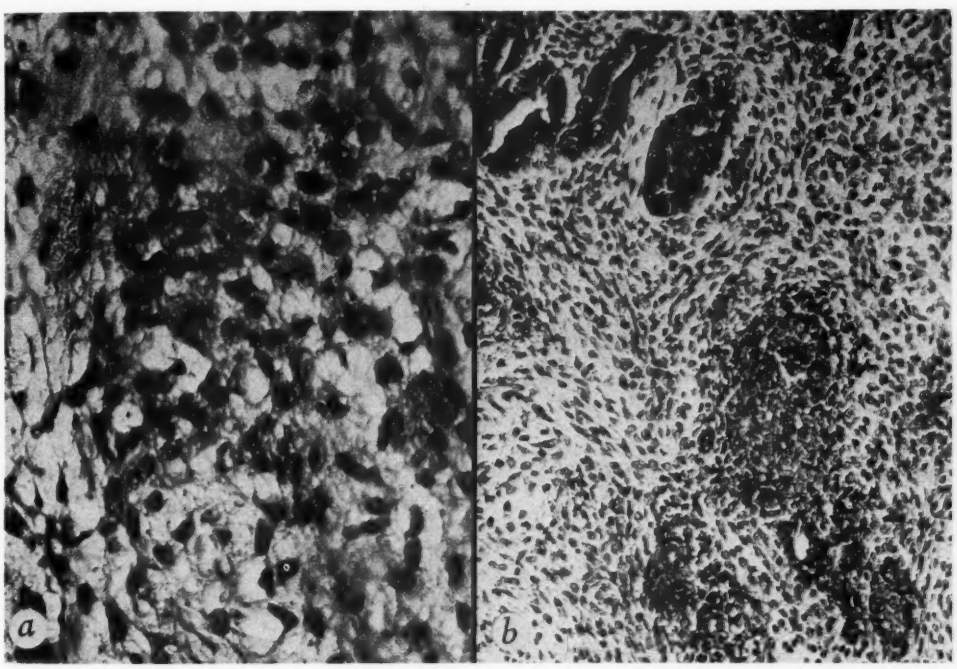


Fig. 3. *a*. Sarcomatous component featuring plump spindle cells in a somewhat myxomatous matrix (hematoxylin and eosin; x375). *b*. The intimate mixture of glandular and sarcomatous elements is reminiscent of renal adenomyosarcoma, or Wilms's tumor (hematoxylin and eosin; x175).

In our case, a careful search for blemishes on the skin and mucous membranes ruled out the possibility of metastasis from a melanoma in an extraovarian location. Likewise, in the teratoma itself, cutaneous structures were not identified. Accordingly, one must conclude that the melanomatous component derived from rather primitive neuroectoderm. An origin via the "retinal anlage" mechanism was considered but this concept was abandoned, since the teratomatous mixture with adenocarcinoma and sarcoma bore no resemblance

to the neuroblastomalike lesions reported by Hayes and Foote[5] and by others.[6-8]

As regards prognosis, it would appear from the literature that, even without the added handicap of the melanomatous moiety, surgical treatment offers little hope for cure in patients who have solid ovarian malignant teratomas. The vast majority of such patients exhibit metastasis at laparotomy. According to Peterson, the presence of adenocarcinoma or sarcoma in one of these neoplasms carries an unusually hopeless outlook. This is perhaps in keeping with the observation that solid malignant teratomas are much more aggressive than are their cystic "opposite numbers."

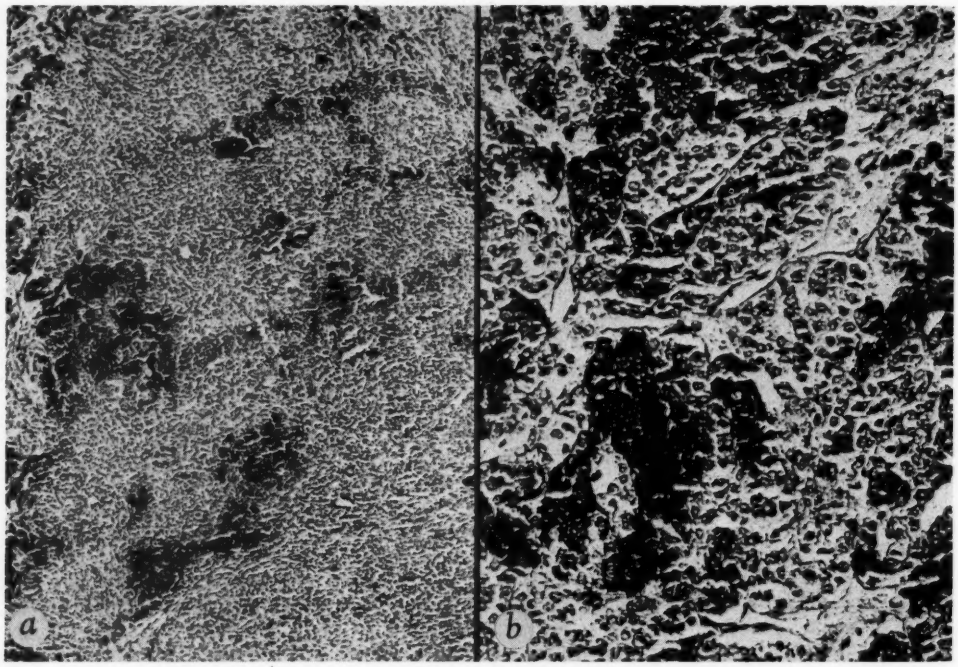


Fig. 4. *a.* Melanoblastic aspects of the tumor, showing irregular disposition of melanin (dark zones) within certain clusters of tumor cells (hematoxylin and eosin; x60). *b.* Clusters of pigmented and nonpigmented malignant melanoblasts arranged in alveolar grouping. Individual tumor cells are epithelial-like (hematoxylin and eosin; x200).

Summary

A case is presented of a seventy-six-year-old woman who had a malignant solid teratoma of the ovary in which the neoplastic mixture consisted predominantly of adenocarcinoma, sarcoma and malignant melanoma. Probably not more than half a dozen similar tumors have been recorded in the literature.

References

1. Peterson W. F.: Malignant degeneration of benign cystic teratomas of the ovary. A collective review of the literature. Obst. & Gynec. Surv., 12:793-830, 1957.
2. Willis, R. A.: Atlas of Tumor Pathology: Teratomas. Washington, D. C.: Armed Forces Institute of Pathology, 1951.
3. Otken, L. B.: Primary melanotic sarcoma of ovary. Am. J. Surg., 55:160-162 (Jan.) 1942.
4. Teilum, Gunnar: Personal communication to Peterson.[1]
5. Hayes, Martin, and Foote, F. W., Jr.: A third case of so-called retinal anlage tumor. Cancer, 4:86-91 (Jan.) 1951.
6. Clarke, B. E., and Parsons, Herbert: An embryological tumor of retinal anlage involving the skull. Cancer, 4:78-85 (Jan.) 1951.
7. Halpert, Béla, and Patzer, Reynold: Maxillary tumor of retinal anlage. Surgery, 22:837-841 (Nov.) 1947.
8. Schulz, D. M.: A malignant, melanotic neoplasm of the uterus, resembling the "retinal anlage" tumors: Report of a case. Am. J. Clin. Path., 28:524-532 (Nov.) 1957.

What's New in Congestive Heart Failure?

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A GENERATION ago physicians prescribed rest, digitalis, diuretic therapy and dietary measures in the treatment of congestive heart failure. Today, although the general approach to the problem of management remains relatively unchanged, refinements in therapy, advances in our understanding of fluid and electrolyte disturbances, and agents permitting more vigorous treatment have increased our therapeutic effectiveness. The cardinal error in cardiac failure is the apparent inability of homeostatic mechanisms to distinguish between real fluid loss by the organism and a mere fluid shift engendered by weakness of the cardiac pump. With the onset of congestive failure, there is a diminution in cardiac output and a decrease in intracranial blood flow as a result of the hypovolemia. An intracranial volume center responds to this stimulus by initiating widespread vascular spasm (in which the renal circulation participates) and by adrenal cortical stimulation with the release of aldosterone. From the therapeutic viewpoint, the abnormal retention of sodium is the most important electrolyte disturbance in congestive heart failure. Although potent diuretic agents now available effectively block the reabsorption of sodium and water in the renal tubules, digitalis and decreased physical activity still remain the mainstay of therapy. Through the increased efficiency of myocardial function, as a result of digitalis therapy, a dramatic diuresis frequently occurs from improvement in intracranial blood flow and consequent re-adjustment of renal and adrenal cortical alterations. To date no fundamental differences have been found among the digitalis glycosides in their effect on the heart. Differences do exist, however, in clinical effect between one glycoside and another and may be due to variations in rapidity and degree of absorption, serum binding power, potency, duration of action, toxic cumulation and dissipation. Consequently, opinions differ as to the relative merits of digoxin, digitoxin, acetyl-digitoxin, and gitalin respectively for routine clinical administration.

Studies undertaken to determine the therapeutic differences in various glycosides administered by the parenteral route have shown that the best glycosides for severe tachycardia are cedilanid and digoxin, whereas the best drug for rapidity of effect was ouabain followed by digitoxin. Digitoxin and acetyl-digitoxin were equally effective in reducing cardiac size and were superior to ouabain for that purpose. Acetyl-digitoxin, cedilanid, and digoxin produced the greatest clinical improvement with the least electrocardiographic changes indicating

that there is no correlation between clinical digitalization and electrocardiographic response. There is some evidence to suggest that in patients with severe electrocardiographic changes due to myocardial damage, acetyl-digitoxin or digoxin should be preferred to digitoxin. This is based on the observation that long-lasting digitalization with digitoxin causes degenerative changes of the myocardium, while that with acetyl-digitoxin, digoxin, or cedilanid is not followed by similar changes. The minimal toxicity was found with cedilanid followed by acetyl-digitoxin and digitoxin. Contrary to expectation, digoxin was found more toxic than the other drugs tested. Nevertheless, when uncertainty exists as to recent digitalis intake, digoxin may be safer than other preparations because of its rapid dissipation. If severe toxic manifestations are feared, then cedilanid should be preferred. The rate of excretion for these drugs was as follows: ouabain was most rapidly dissipated followed by cedilanid, digoxin, gitalin, acetyl-digitoxin, and digitoxin. From all of these observations, digitoxin and acetyl-digitoxin appear to be the glycosides of choice. Digitoxin would be preferred for a short range course and acetyl-digitoxin for a long range course. Digitoxin was the only drug that could be given by the intramuscular route without causing excessive pain. Digitoxin, having a lower rate of elimination, gives a more constant level of digitalization. On the other hand, even though less toxic in a short term treatment, digitoxin may be more damaging to the myocardium on a long term basis because of electrocardiographic changes and arrhythmias, so that acetyl-digitoxin or digoxin might be preferred. Gitalin occupied an intermediary position and was considered as equivalent to a complete extract of digitalis with all its advantages and disadvantages.

It is generally agreed that the determinant of good therapy is the physician's knowledge of the application of any one of these preparations rather than the particular merits of the agent employed. The treatment of digitalis intoxication or toxicity consists primarily of stopping the digitalis until all evidence of overdosage has disappeared, the restriction of the patient's activities and the giving of potassium salts. Potassium may be administered in doses of 5 to 7.5 grams of potassium chloride in divided oral doses, and this dosage should be reduced or stopped after the therapeutic result has been achieved.

Diuretic agents are a valuable addition to our therapeutic armamentarium through their ability to block the reabsorption of sodium and water in the renal tubules. In practice, physicians frequently prescribe, in an arbitrary and haphazard manner, diets and drugs that strongly influence water and electrolyte balance. Such empirical procedures must continue until we can measure the state of intracellular water and electrolytes. In general, there are four groups of diuretics in common use today.

The mercurial diuretics, when given parenterally, are the most potent agents available. They have minimal side effects and produce a persistent diuresis and natriuresis. Parenterally administered mercurials are quite effective in the acute phase of treatment and are efficient for maintaining the edema free state.

Since the development of potent orally administered diuretic agents, however, interest has shifted from parenterally administered drugs. The organic chemist has provided the clinician with several diuretic agents which are both potent and relatively free of untoward pharmacological actions. The benzothiadiazine derivatives, notably chlorothiazide and hydrochlorothiazide, have proven to be the most effective oral diuretics at the present time. They produce an effective loss of sodium, chloride, bicarbonate, and potassium. *In vitro* studies reveal a definite carbonic anydrase inhibiting factor which, however, does not explain the diuretic response seen in clinical application. Refinement of the activity of chlorothiazide has been obtained by altering the basic structure of this drug. Hydrochlorothiazide and trifluoromethylthiazide have been developed and differ from chlorothiazide in certain features. The dose of hydrochlorothiazide necessary to produce an equivalent sodium loss is approximately one-tenth of that of chlorothiazide. Chlorothiazide has had the drawback of causing a great loss of potassium from the body and thereby inducing undesirable symptoms. To date, hydrochlorothiazide does not appear to have this effect. However, these drugs are not without other harmful effects: excessive potassium loss in the case of diuril and salt depletion with all of them. Chlorothiazide should not be given in full dosage, 2 gm. per day, for more than three or four consecutive days unless (1) potassium chloride supplements are used, and (2) plasma electrolytes are carefully followed. Potassium chloride therapy may be hazardous in edematous hyponatremic subjects and should be begun cautiously

with oral doses of 2 to 4 gm. daily. The safest therapeutic regimen appears to be the administration of chlorothiazide for three or four days followed by a three or four day rest period in order to allow K and chloride balance to return to normal. When more intensive diuresis is desired, a carbonic anhydrase inhibitor may be alternated with chlorothiazide. Carbonic anhydrase inhibitors, such as Diamox, produce hyperchloremic acidosis and thus may compensate for the hypochloremic alkalosis due to chlorothiazide or mercurial agents. Since all three agents can produce a negative K balance, potassium chloride supplements may still be necessary.

Carbonic anhydrase inhibitors such as Diamox have served as efficient diuretic agents in the mild to moderate states of edema with a low incidence of side effects. Their action is inhibition of the carbonic anhydrase in the renal tubular epithelium with resultant depression of hydrogen transport and hydrogen sodium exchange. These agents lose their diuretic effect in three to four days and therefor cannot be used continuously.

The xanthine diuretics, such as aminophylline, are still in common usage but their potency is poor when compared to the mercurials. However, the combination of the xanthine diuretic with one of the other groups of diuretics, frequently potentiates diuresis. Mictine and rolicton have proved to be effective oral diuretics, but their efficiency is limited to the mild to moderate states of edema and must be used intermittently to maintain maximum response.

Potent oral diuretics have made it possible to liberalize the cardiac patient's diet with respect to salt intake. This makes food more palatable thereby somewhat lessening the possibility that malnutrition will develop. Most patients with congestive heart failure show satisfactory improvement when treated with digitalis, diuretics, restriction of salt intake, and limitation of activity; their symptoms improve, and the edema is carried away by an increase in urinary volume. However, many such patients begin after a time to exhibit loss of responsiveness to diuretics and finally develop edema that seems to be intractable. The modifications in treatment necessary to restore responsiveness to diuretic drugs requires an understanding of the factors responsible for the development of intractable edema. There are many possible factors, and most of them fortunately may be recognized after careful physical examination or relatively simple laboratory tests. Among possible factors are inadequate digitalization, extremely low renal blood flow due to intrinsic renal disease or terminal congestive cardiac failure, complicating infections, masked hyperthyroidism, anemia, cardiac arrhythmias, chloride depletion, sodium depletion, low plasma-albumin levels, thiamine deficiency and other complicating states.

Repeated mercurial diuresis at short intervals may induce excretion of chloride in excess of sodium as compared to their relative concentrations in the plasma. The resulting serum electrolyte pattern may be described as hypochloremic alkalosis with hypokalemia. It may be avoided if ammonium chloride prior to or during the mercurial diuresis provides chloride to replace that lost in the urine. If diuresis is very profuse, several days should elapse between mercurial injections so that the disproportionate chloride loss is adjusted by dietary intake and renal excretion. Hypochloremic alkalosis, due to mercurial diuresis, may itself be responsible for unresponsiveness to diuretics. The treatment of hypochloremic alkalosis consists of the administration of chloride cautiously in the form of dilute hydrochloric acid or ammonium chloride (6 to 9 gm. daily), if there is significant hypokalemia, potassium should also be administered.

Repeated mercurial diuresis may result in a marked excretion of chlorides, sodium, and water. When water, and to a lesser extent chlorides, are replaced by oral intake of these substances but sodium intake is stringently restricted, a serum electrolyte pattern characterized by hyponatremia may result. Schroeder related a clinical picture to this electrolyte pattern and termed it the "low salt syndrome." This was characterized by hyponatremia, azotemia and refractory heart failure. It has become increasingly apparent that hyponatremia may result from a variety of mechanisms.

In the majority of cases of hyponatremia associated with heart failure, sodium depletion is *not* the responsible mechanism. In these there is no evidence of abnormal sodium loss externally and total body sodium is considerably increased. The hyponatremia results from water dilution of the extracellular sodium. The explanation for this disproportionate retention of water when sodium intake and excretion are minimal is not clear. Associated renal impairment may be an important if not an essential underlying factor. On the other hand, the impairment of water diuresis may be due

to increased secretion of the anti-diuretic hormone (ADH) in advanced heart failure rather than to renal impairment. It appears probable that the occurrence of dilution hyponatremia is itself a manifestation of advanced or intractable heart failure rather than a cause of it. However, at this state of heart failure, extreme restriction of sodium coupled with the administration of mercurial diuretics may further impair the renal excretion of water as well as of sodium instead of inducing diuresis and clinical improvement as they do when heart failure is less severe and still responsive to therapy.

Depletion and dilution hyponatremia may often be distinguished by a careful history of the sequence of development and the exact nature of the symptoms. Evidence should be sought of actual external sodium losses (profuse diuresis, paracentesis, thoracentesis, vomiting, diarrhea or salt-losing nephritis) and signs of dehydration, muscle cramps, weakness and a shock-like state. Treatment of depletion hyponatremia consists of increasing sodium intake by mouth in mild cases. Hypertonic sodium chloride (300 cc. of a 3% or 5% solution) is administered intravenously when the need is more urgent or the patient is unable to take sodium orally.

When hyponatremia is of the dilution type, one should consider carefully other possible causes of the clinical picture than hyponatremia. Overdigitalization should be corrected. Since intractable heart failure is often the reason for the hyponatremia, careful survey of all possible complicating factors or of imperfections in therapy should be made. If the heart failure is alleviated, the hyponatremia may be simultaneously corrected without direct attempts to correct the chemical change. Fluids as well as sodium should be restricted. (Similar to lower nephron nephrosis.) The fluid intake should not exceed the urinary output plus 500 cc. to allow for fluid loss by insensible perspiration. Administration of sodium orally or intravenously is contraindicated. The administration of potassium is rarely followed by a significant diuresis or clinical improvement despite the reported rise in serum sodium.

Various reports indicate that prednisone may dramatically influence refractory cardiac edema with a resultant marked increase in urinary output, restoration of response to mercurial therapy and significant diminution in congestive phenomena. It has been postulated that prednisone, in such instances, may antagonize the antidiuretic hormone of the posterior pituitary gland or reduce the output of the electrolyte-retaining steroid, aldosterone.

Blood pressure reduction alone by ganglion blocking agents has been found to influence favorably hypertensive heart failure in many patients with this disease. The observations seem to warrant the conclusion that in most patients the cardiac overload plays a more important part in the pathogenesis of hypertensive heart failure than an irreversible change in heart muscle. Reduction in blood pressure by ganglion blocking agents should therefore be considered when control of congestive heart failure is unresponsive to other means of therapy.

Recent observations indicate that administration of nitroglycerine sublingually is clinically effective in the relief of respiratory and retrosternal distress of paroxysmal nocturnal dyspnea. Studies in our laboratory have shown that nitroglycerine causes venous pooling in the lower extremities and splanchnic area with diminished venous return to the heart. Catheterization of the right side of the heart has demonstrated that nitroglycerine produces a prompt reduction in the pulmonary artery hypertension associated with failure of the left ventricle. Nitroglycerine therefore appears to have an important place in the management of patients with pulmonary artery hypertension and paroxysmal dyspnea associated with failure of the left ventricle.

Conclusion

The fundamental electrolyte disturbance in heart failure is the abnormal retention of sodium and the dramatic improvement in the outlook of patients with heart failure in recent years has been due to correction of this abnormality by a more effective use of very low sodium diets and mercurial diuretics. New potent oral diuretics when used alone or in combination with a mercurial may promote the mobilization of edema fluid when other measures have failed. These agents appear to be at least as potent as the organic mercurial itself and by their proper use congestive heart failure may be managed in many cases with a free salt intake or at least a liberalization of dietary measures. With proper understanding of blood electrolyte patterns in heart failure and with reasonable caution, it is possible to avoid serious electrolyte disturbances without surrendering the advantages of these agents fully utilized for maximum therapeutic effect.

Penicillin and the "Fleming Myth"

On Reading "The Life of Sir Alexander Fleming" by Andre Maurois

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WHEN the Oxford team under Sir Howard Florey successfully treated with penicillin groups of experimentally-infected animals on May 25, 1940, a considerable impetus was given to the creation of the "Fleming Myth." The penicillin, extracted after arduous labor from the mold *penicillium notatum,* appeared to be nontoxic and highly efficient against lethal infections. The perfect "magic bullet" of Ehrlich seemed to be at hand. Would the acclaim and honor have come to Fleming during his lifetime without the efforts of the Oxford group? Possibly, but I doubt it. In this biography, André Maurois has presented a brilliant and lucid account of the circumstances that led to the discovery of penicillin, and of the struggles that were made in order to produce sufficient penicillin for use in patients. The author has also tried to penetrate the outer surface of this rather shy, reserved and inarticulate Scotsman. He presents him as a scientist possessed with an undeviating purpose, who was endowed with good health, and a brilliant and penetrating intellect.

It is given to some men, including warriors, statesmen, politicians and scientists, to have a myth built around them during their lifetime. This happened to Alexander Fleming. After the therapeutic virtue of penicillin had been substantiated, a "Fleming Myth" quickly arose. As he traveled about the world he was treated in some areas as a conquering hero, and in other places with saintly reverence. Maurois brings this out vividly in describing his trips to Spain, Greece and to India. Fleming was quite cognizant of this myth. Indeed, he kept a scrapbook of clippings, and he used to amuse himself, his friends, and his family in chuckling over some of the statements made about him. Through it all, Fleming never lost his sense of humor or his deep feeling of humility. I have the impression that he traveled about, not so much to be honored, but because he loved people, and he was curious about how other people lived and worked. He had had little opportunity or money as a research man to do much traveling. Furthermore, he was a loyal British subject, and a good ambassador.

Fleming is honored and known today for his discovery of penicillin. He shared in the Nobel Prize for this effort. However, Fleming himself did not consider this his greatest achievement. He made such a statement after a moment of reflection, on a visit to Minneapolis. He derived a greater sense of achievement from his discovery of lysozyme, a nontoxic, antibacterial substance found in human tears. This material, plus the simple techniques that he used in the laboratory for studying it, prepared him for the subsequent discovery and investigation of penicillin.

The essential background of Fleming's monumental achievement was his determined search for an antiseptic that was destructive for bacteria but harmless for the tissues and body fluids. He had witnessed the shortcomings of all antibacterial agents during World War I in the treatment of war wounds. He crystallized this objective early in his career when he was in the Inoculation Department of St. Mary's Hospital in London with Sir Almroth Wright as his Chief. He arrived at St. Mary's Medical School because of his love of athletics and because he had already established himself as a brilliant student. Unlike American medical schools, the medical schools in Britain, especially in London, emphasize athletic competition. Roger Bannister, the first human being to run a mile under four minutes, attended St. Mary's. Fleming was born into a large family on a remote Scotch farm. This isolated background probably accounted for his shyness, his reserve, and for his great love of nature, which may in turn have directed him into a biological science and medicine.

No biography of Fleming would be complete without more than a passing reference to his Chief, Sir Almroth Wright. Fleming joined Wright in 1906, after completing his studies in medical school.

Years later he was to succeed Wright as the Director of the expanded Wright-Fleming Institute at St. Mary's, retiring to the laboratory in 1955. Fleming's entire scientific life revolved about St. Mary's. Wright was the antithesis of Fleming. (For a vivid and detailed portrayal of this unusual man the reader should consult Leonard Colebrook's biography of Wright.[1]) André Maurois devotes considerable attention to him as a man and as a scientist. Of Irish origin, he was dynamic, voluble, brilliant and given to dogmatism. He cherished comradeship with accomplished people in all walks of life, including his close friend, George Bernard Shaw. He ruled the laboratory with an iron will. Fleming got along well with this genius because of his shyness, because Wright recognized his extraordinary ability, and because Fleming respected his Chief and spoke out very seldom.

When Fleming joined the team at St. Mary's the prevention and treatment of infectious diseases along modern lines were in their infancy. Wright was obsessed with the idea that the future was much brighter for immunotherapy than for chemotherapy, a position which he maintained even after the introduction of the sulfonamides. He was a firm advocate of the value of typhoid vaccine, which he had introduced, for the prevention of typhoid fever. In fact, he left the Army Medical Service and started his long career at St. Mary's because the military authorities did not look with enthusiasm upon his attempts to immunize army personnel against typhoid fever with a vaccine. He created many simple and classical techniques for measuring immune responses, such as the agglutination reaction for typhoid fever and Malta fever. He also originated the opsonic index for quantitating antibacterial immunity, a method in which the phagocytic efficiency of leukocytes for bacteria is determined. Fleming fell heir to the thinking and techniques of this great man. One of the outstanding scientific attributes of Fleming was the facility with which he employed simple procedures for quantitating the antibacterial efficiency of various chemicals.

While putting these thoughts together, I had occasion to chat with a distinguished internist in Minneapolis, Dr. Henry Ulrich, who is Emeritus Clinical Professor of Medicine of the University of Minnesota Medical School and still active in the practice of medicine at eighty-three years of age. A graduate of Johns Hopkins Medical School, he worked in the Inoculation Department of St. Mary's in 1907 and 1908. He went there to learn serology under Sir Almroth Wright, and occupied a bench in the laboratory next to Fleming. Dr. Ulrich spoke with glowing enthusiasm about the brilliance of Wright and his serologic procedures, including the opsonic index. Wright demanded absolute honesty in research, and his first question in evaluating the report of an investigator in the scientific literature was, "Is he honest?" Dr. Ulrich remembered Fleming as quietly going about his chores for Wright.

Fleming's first significant scientific contribution was reported in 1921, fifteen years after he had joined Wright. It was the discovery of lysozyme. He had observed that nasal mucus destroyed bacterial colonies on the surface of an agar plate. Human tears and egg-white were also found to be a source of this antibacterial agent. While studying lysozyme, Fleming developed a simple, but effective technique for measuring its antibacterial activity, which was to be employed later for penicillin. This consisted of making a gutter in the agar contained in a Petri dish, impregnating agar with lysozyme and placing it in the gutter, and then streaking different bacterial cultures at right angles to the gutter. As the lysozyme diffused from the gutter through the agar, susceptible bacteria failed to grow in its vicinity. Unfortunately, lysozyme was active against only less virulent bacterial strains. He presented his results on lysozyme before his Medical Research Club in London and "the reception accorded to the paper was cold beyond belief." But he was not deterred. He developed another simple technique for quantitating the antiseptic value of different substances. This was the slide-cell technique in which two glass slides are placed on top of each other separated "by five strips of Vaselined paper, placed at regular intervals at right-angles to the longest axis of the slides." Thus, there were four little spaces into which defibrinated blood mixed with bacteria could be placed, and the ends of the slides sealed. After a suitable period of incubation, the multiplying bacteria could be studied under the microscope and also the phagocytic activity of the leukocytes could be observed. The effect of antiseptics on leukocytes could also be noted.

Fleming relentlessly pursued his idea of finding an antiseptic that would destroy microbes, and yet not harm the cells of the body. As Maurois states, "In most of the great scientific discoveries there has been one part deliberate research and one

part luck. Pasteur, a man of unusual firmness of purpose who sought the truth with a combination of pure reason and experiment, was sometimes helped by chance." Pasteur was Fleming's great hero. All the world knows about Fleming's chance observation. Staphylococci had been planted on the surface of an agar plate. The plate became contaminated by a mold, and in the vicinity of the mold the cocci were lysed. Possessed with the experience of lysozyme he quickly saw the possibilities of the activity of this mold. He grew the undefined mold, made an extract, and found that it was highly active against pathogenic bacteria, and nontoxic when injected into animals. He published his classic paper on penicillin in 1929, at the age of forty-eight.

The recognition of penicillin was a great discovery and Fleming appreciated its potentialities in human disease, but he soon found out that he was faced with considerable difficulty in trying to obtain enough of the material for adequate studies in animals. He was not a chemist. He was a lone research worker and not surrounded by a team. He sought help from one of England's foremost chemists, Professor Harold Raistrick. But penicillin was an elusive and unstable substance and Raistrick and his associates were unsuccessful in extracting penicillin. But chance favored another prepared mind. Professor Howard Florey at Oxford suggested to a brilliant chemist with him, Dr. E. B. Chain, that he study lysozyme. Chain was intrigued by this substance and while searching through the literature on similar antibacterial substances, he came upon Fleming's paper on penicillin. Under the competent leadership of Florey, the chemical mystery of penicillin was pursued by Chain and his associates. The Rockefeller Foundation agreed to subsidize this study with a grant of $5,000. As a result, the Oxford team successfully isolated enough penicillin for some decisive animal experiments, which were published in 1940. It was a happy day in the life of Fleming when he read this report in the *Lancet*. He was now approaching his sixtieth birthday and it appeared that his goal had been reached.

Although the Oxford team had produced sufficient penicillin for evaluation in the laboratory, the large-scale production necessary for human purposes would require participation of the chemical industry. But England by this time had been plunged into World War II. Professor Florey then journeyed to the United States for help, and a fortunate chain reaction of accomplishments leading to large-scale production of penicillin resulted. He sought out Charles Thom, the mycologist who had identified *penicillium notatum,* and who was Chief of the Mycological Section of the Northern Regional Research Laboratory at Peoria, Illinois. In turn, he met Dr. Coghill, Chief of the Division of Fermentation at Peoria. Corn steep liquor was suggested in the fermentation of the penicillium culture and this was successfully used. Florey's old friend, Dr. A. N. Richards, had just been appointed President of the Committee of Medical Research of the National Research Council, and seeing the potentialities of penicillin in an all out war effort, Dr. Richards interested the Government of the United States in the production of penicillin. Finally, American industry became involved in the effort and by 1942 and 1943 penicillin had become available for the Armed Services. During this visit of Professor Florey to the United States, he stopped off to see Dr. O. H. Wangensteen at the University of Minnesota. Dr. Wangensteen invited a few of us to have dinner with Professor Florey, and during the course of the evening this mild-mannered Professor from Oxford unfolded the almost unbelievable story of penicillin.

By 1943 honor after honor was heaped upon Fleming. The "Fleming Myth" had started. He was knighted by his King, elected to the Royal Society, and shared with Florey and Chain in the Nobel Prize. He was to begin his travels about the earth acquiring further honor and fame. In between trips he was to be found at St. Mary's. Sir Almroth Wright had died in 1947, Fleming having become the Principal of the Institute in 1946. But one further event of major interest did occur in the life of Fleming, mixed with pathos and with romance. His wife Sareen, to whom he had been devoted for thirty-four years, died in 1949. This left Sir Alexander a very lonely man. In 1946 an intelligent Greek woman scientist, Dr. Amalia Coutsouris-Voureka, joined the Institute at St. Mary's. She was devoted to Sir Alexander, and after the death of Lady Fleming he often emerged from his loneliness in the presence of this lady. In the spring of 1953, they were married and they were to share many happy months together at home and abroad. The concluding chapter of this biography by Maurois is headed "Too Short a Happiness." On the morning of March 11, 1955, at the age of seventy-four years, Sir Alexander Fleming quietly slipped out of this world as a result of a heart attack. England hon-

ored him once again with burial in the crypt of St. Paul's Cathedral "close to the towering tombs of Wellington and Nelson."

Those individuals engaged in writing biography often have different purposes in mind. One writer tries to get at the inner man. Another author endeavors to depict the impact of an individual's work upon society. Still another writes a popular and semi-fictional biography. A biographer writing about a contemporary has the advantage over one trying to reach back over the ages and still be accurate. Unfortunately, although recently deceased, Fleming was already enshrouded in myth. Maurois has written a good biography. For me, the most exciting pages are those dealing with Wright and the early days of Fleming at St. Mary's, those describing his studies on lysozyme, and those leading up to the discovery of penicillin. The subsequent story of his travels and honors are an anti-climax, and the details of his second romance a bit superfluous.

However, we still lack a clear-cut picture of the inner man of Fleming. I had occasion to meet him several times. Professor Robert Cruickshank, Sir Alexander's successor at St. Mary's and now Professor of Microbiology at Edinburgh University, invited me to speak in 1951 at the International Congress of Clinical Pathology. I lectured at the London School of Hygiene and Tropical Medicine with Sir Alexander in the Chair. This was my first meeting with him. He asked my wife and me to dine with him at the Atheneum Club, calling for us at our hotel personally in his small English car. After that, the three of us spent the evening at the Senate House of the University of London attending a reception given by the Vice-Chancellor. Sir Alexander was the perfect host, generous and very friendly. He confided to us that he was a very lonely person since the death of his wife. My wife and I saw him again under totally different circumstances. He came to Minneapolis in the spring of 1953 with his second wife, and we entertained them in our home. He was lively and full of fun, taking a great interest in our two children. Maurois has described his love of children and how he enjoyed playing with them. After dinner he took my six-year-old son on his lap while we talked at length about penicillin. All during the conversation my son, Billy, said nothing, but at the conclusion of the discussion, he looked at Sir Alexander and said, "And now about this penicillin, I don't like the cherry taste!" Fleming laughed with delight. It is of interest to me that having met him after he had achieved fame, I found him to be a likable person, but I really didn't learn too much about science in talking with him. Perhaps he felt that his working days were behind him. Furthermore, he had been away from the laboratory bench for a long time.

Fleming now belongs to the ages, because there is little doubt in my mind that the "Fleming Myth" will persist and probably grow. One is tempted to conclude by questioning the greatness of his contribution to science. Some of his contemporaries and his own friends consider that Sir Almroth Wright was far more brilliant and original. In fact, Sir Howard Florey,[2] speaking thirteen years after he had shared the Nobel Prize with Fleming, stated "No new scientific ideas were involved in the discovery of penicillin." Sir Howard is a little severe with him.

For me, the greatness of Sir Alexander Fleming resides in two different spheres. First, Fleming was obsessed with an idea that he shared with Sir Almroth Wright. The effective antiseptic for wounds must be destructive for microbes without harming the tissues of the host. This may have been an old idea, but with this in mind he developed simple techniques for studying various antimicrobial agents. Above all, *he discovered penicillin.* Second, in this day of scientific inquiry there is a strong tendency for large sums of money to find their way into "team research." Fleming's scientific life was the opposite of this trend. He represented the individual investigator expanding his own ideas in his own way. Chain, who also shared in the Nobel Prize with Fleming and Florey is quoted by Maurois as follows: "The work of a team is important for the development of an idea already formulated, but I do not believe that a team has ever produced a new idea." Thus, the genius of Fleming, and the basis of the "Fleming Myth" are reflected in the picture of him in his small laboratory, grasping the significance of a mold that had fluttered through the air, settled on his plate of bacteria, and destroyed the staphylococcal colonies. Chance had favored the prepared mind.

References

1. Colebrook, L.: Almroth Wright. Provocative doctor and thinker. London: Heinemann, 1954.
2. Florey, H. W.: Penicillin in Perspective. Antibiotics Annual, 1958-1959, P. 12. New York: Medical Encyclopedia, Inc., 1957.

Editorials

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COUGH REMEDIES: OLD AND NEW

Cough sedatives and expectorants have been in use for many years. Even so, treatment of cough in present-day practice leaves a great deal to be desired. Efficiency in this regard is much more than stereotype administration of time-honored drugs. It can be attained only through clear understanding of the physiology of cough, pharmacologic principles that apply to the respiratory system, and by their competent application to the individual problem.

Two types of cough are recognized: (1) productive cough; (2) unproductive cough. The terms are self-explanatory. Unproductive cough is useless and may entail adverse consequences because of the stress and strain it exerts upon the lung, heart, blood circulation, and the entire organism. Unproductive cough may originate from diseases of the paranasal sinuses, nasal obstruction, laryngeal tumor, pressure upon the trachea and bronchi by enlarged thymus, substernal goiter, enlarged lymph nodes, aneurysm or anomalous large blood vessels, mediastinal inflammation and neoplasm, large pulmonary cysts, benign and malignant tumors of the lung, bronchial granuloma and stricture. In addition to a long array of other conditions, one should underscore the causal role of pulmonary fibrosis, allergic and non-allergic bronchospasm, and pseudohypertrophic emphysema (hypertrophic, obstructive emphysema). In some of the inflammatory conditions of the bronchi (due to infections, allergens, noxious dusts, gases or tobacco smoke), there is considerable congestion and swelling of the mucosa, while formation of exudate is practically nil. This results in unproductive cough. The latter, moreover, is noted in pleurisy and in instances of reflex irritation of the vagus nerve from pathologic changes in the chest wall, diaphragm and extrathoracic structures.

Unproductive cough is harmful; therefore, it should be stopped. Slight cough may be allayed by lozenges medicated with volatile oils (menthol, thymol, eucalyptol), by swallowing a teaspoonful of honey, sweetened water, fruit juice or ice chips. Volatile oils increase mucosal secretions in the respiratory tract. Also, lozenges that contain a mild local anesthetic, such as ethyl aminobenzoate (Benzocaine) and others, are of benefit. Scratchy irritation and tickling sensation in the throat which precedes cough may be due to pharyngitis or laryngitis or to a reflex which is transmitted from the pulmonary plexus through the inferior and superior laryngeal nerves. Too, slight cough may be controlled volitionally or by teaching the patient to take a deep breath slowly, then exhale quickly and forcefully with the glottis open.

When unproductive cough becomes troublesome, hard, strenuous or exhausting, it should be suppressed with so-called cough sedatives. I have found dihydrocodeinone bitartrate superior to all other drugs in this category. It is available under proprietary names, such as Bi-Co-Tussin, Codone, Dicodid, Hycodan, Mercodinone, Paracodin, Rapacodin, Stodcodan, and in combination with other drugs. Next in efficacy are two alkaloids of opium: codeine and noscapine (narcotine, narcosine). Their dose is the same because, milligram for milligram, they are of equal therapeutic potency. It is worthwhile to remember that the analgesic action of codeine is better than that of noscapine. On the other hand, noscapine like papaverin, although an opium derivative, is not habit-forming. Rarely may it be expedient to prescribe pantopon or dilaudid.

A word of warning concerning morphine. It affects the respiratory system adversely in that it depresses the respiratory center, inhibits bronchial secretions, causes bronchospasm and thus interferes with bronchial peristalsis and bronchocatharsis. For this reason, its use as a cough remedy should be limited to patients with pain due to inoperable tumors of the lung and mediastinum or to aortic aneursysm. Also, it is permissible for patients with cardiac decompensation, excessive cough and dyspnea. Recent years have brought significant progress in this field, with the introduction of synthetic cough sedatives. These include benzonatate (Tessalon), carbetapentane citrate (Toclase), caramiphen ethanedisulphonate (Toryn) and dxtromethorphan hydrobromide (Romilar, Methorate).

Some years ago, I advocated the term "tussive

insufficiency" for designating excessive, oftentimes annoying, strenuous cough which is not capable of evacuating inflammatory exudate, transudate, extravasated blood or foreign bodies from the lung. Prompt and efficient relief of this symptom is mandatory. Auscultation of the chest is indispensable for ascertaining the presence of exudate in the bronchi and alveoli. To be proficient, one's auditory perception must accommodate to listening through the stethoscope as one's eyes accommodate to darkness before fluoroscopy.

Ammonium chloride, potassium iodide, creosotes, guaiacols, terpin hydrate, ipecac and senega are known for their capability in liquefying heavy, thick, tenacious, highly viscous mucopurulent bronchopulmonary exudate. It is useless to prescribe ammonium chloride in enteric-coated tablets. Small doses of potassium iodide are better than large doses. The potassium content of the latter may cause bronchospasm and, consequently, interfere with bronchial peristalsis and broncho-catharsis. Excessive viscosity of pulmonary exudate can be reduced by detergents, namely by the inhalation of an aqueous solution of superinone (Alevaire) and of Tergemist. Similar purpose is served by mucolytic agents, such as crystalline trypsin (Tryptar) given in solution by inhalation, or lyophilized trypsin (Parenzyme) by intramuscular injection; aerosolized pancreatic dornase (Dornavac). A combination of streptokinase and streptodornase (Varidase) in buccal tablets is also useful in this respect. I should like to point out that one of the best expectorants is inhalation of 5 per cent carbon dioxide and 95 per cent oxygen. The gas mixture is available in tanks. It is given through a face mask, with a flow rate of 5 liters per minute, for fifteen minutes three times daily for days, weeks or months, as circumstances require.

Assuming that heavy exudate in the lower air passageways has been successfully liquefied, its evacuation is substantially aided by bronchospasmolytic drugs, such as isopropylepinephrine (Isuprel, Aludrine, Norisodrine), 2.5 per cent solution of racemic epinephrine hydrochloride (Vaponephrin), phenylephrine hydrochloride (Neosynephrine hydrochloride), ephedrine and similar preparations, aminophylline, some of the anticholinergic drugs and corticosteroids.

Important adjuncts in the correction of tussive insufficiency are intermittent positive pressure breathing, exsufflation with negative pressure and portable cough machines. Particularly the latter can be used to advantage in cases with pronounced impairment of the respiratory muscles (poliomyelitis, Parkinson's disease, trauma).

In patients with pseudohypertrophic emphysema, tussive failure may be relieved by elevating the diaphragm from its abnormally low position and, consequently, restoring its function in the cough mechanism. I have been using artificial pneumoperitoneum for this purpose with gratifying results since 1930.

No matter what drug or method is prescribed for the amelioration of tussive insufficiency the following rules should be observed.

1. Hydration of the respiratory tract by increased fluid intake, "steam" inhalation or humidification of the atmosphere.
2. Postural drainage of the lung whenever necessary.
3. Weight reduction in obesity.
4. Stopping smoking.
5. Appropriate, prompt treatment of the underlying causative disease.

ANDREW L. BANYAI, M.D.

SOCIAL SERVICE

Hospital and Community Participation

All social workers at the University Hospitals are confronted with problems similar to those of the patients we are presenting today. A "Donald Matson"* of any age from any county in the state may be occupying a bed right now on Pediatrics, Neurology, Psychiatry or any one of the other medical services. This patient was chosen because his situation was a good illustration of "Community Agency Participation in Medical Care" in a variety of areas, and since this patient remained in Minneapolis, we were able to keep in touch with him for a longer period of time.

From Mr. Cremers' article, it is apparent that the social agencies in the community had done considerable planning prior to the patient's transfer from the local hospital to University Hospitals. Working in as large and as complex an institution as the University Hospitals, we often overlook this factor. Todd County is one of the twenty-three counties of the state operating on a township system of relief. This means that the township in which the person has legal residence is responsible

*The name "Donald Matson," as used throughout this editorial, is fictitious.

for providing financial assistance other than University Hospital care which is provided from county and state funds. A township is a small area six miles square, so the amount of money available for relief purposes is always limited. In counties operating on a county system, the county welfare board would have had funds, and would have provided for many of the things Donald required. As pointed out in Mr. Cremers' paper, ten out of eighteen organizations and agencies of Todd County were used for the rehabilitation of Donald Matson. Three of these remained active throughout the two-year period, maintaining interest and support. The hospital added six more social agencies to this number, actually using four. The hospital chart contains a file of eleven letters from social agencies, fourteen letters to social agencies, four physician's reports and four medical report forms. The number of individual and group conferences could not be estimated.

Briefly reviewing what happened prior to admission to the University Hospitals, Donald had suffered a fracture of the spine in an automobile accident and he had been hospitalized in a local hospital for about five months, with one unsuccessful attempt at discharge home for one week. According to the report, the attempt was unsuccessful because "in the week that he was home he was not out of his wheel chair. His parents were afraid that they would hurt him and, as the mother explained, 'we had no bed for him.'" The community hoped that in addition to medical care he could be taught to care for himself and that some consideration would be given to a vocational program. It was assumed that the patient would finish high school upon his return home, and a suggestion of a job in the local printing establishment was offered as a possible vocational placement.

The medical report presented by Dr. Sandler shows that on Donald's arrival at University Hospitals he was found to be paralyzed from the waist down; he had a large sacral decubitus, an incompletely healed fracture of the right tibia and fibula, a urinary tract infection, and urinary and fecal incontinence.

When I first saw this seventeen-year-old boy, he was lying on his side in bed listening to a ball game on the radio. His conversation about the players indicated that he was an ardent, well-informed baseball fan. He was a good-looking, dark-eyed, curly-haired boy of medium build. He was friendly, and spoke freely about his accident, the attention he had received in the community, and about his family. He showed me some kodak pictures he had in his billfold and letters he had received. The subject of school was brought up, and he said that his accident had happened about six weeks before the end of the year and he thought he was "passed." He thought he should find out and accepted the suggestion that I write to the school so that we might continue the school program in the hospital.

The school report was disappointing. He scored D and F in all subjects except industrial arts in which he got C's. His behavior traits as recorded by his teachers showed that in initiative and industry he needed constant prodding, he lacked ability in judgment and common-sense and his reliability was inaccurate. He was well liked in senior high school but was tolerated in junior high school. There was nothing to indicate that he had been "passed."

During the following months between surgical and medical procedures, the patient was given a number of psychological tests. The Minnesota Multiphasic Personality Inventory indicated that he was somewhat tense, irritable, and pessimistic and that one might anticipate such signs of psychological distress as easy fatiguability, feelings of inferiority, inadequancy, and depression. The Wechsler-Bellevue Intelligence Scale gave a full scale I.Q. of 107, a verbal scale of 101 and performance scale of 111. A summary of the tests showed him to have average learning ability, masculine interests with poor achievement in academic areas.

Representatives from the State Division of Vocational Rehabilitation were invited to the hospital to discuss Donald's future vocational program. At this time, it was felt that the most feasible occupational goal would be a linotype operator. This occupation was selected because there was a job available in the community, it was a sedentary occupation well suited for a paraplegic, and it would not require extensive education and training. His deficiencies in grammar and spelling coud be overcome by remedial work in prevocational classes. Although the patient appeared to be somewhat indifferent to the training program, he seemed quite willing to accept the occupation of a linotype operator, probably because of the mechanical nature of the job. The plan was agreed upon, and the vocational

rehabilitation counselor was to contact the local publishing company to make certain a job would be available to him. The patient was started on prevocational classes. At this point, the patient's decubitus was healing satisfactorily, his braces had been delivered and a special wheel chair had been ordered and payment approved by the local community.

A visit to the hospital at this time by the chief of police, who was also the village recorder gave additional social information. The chief of police had been in to see the patient a few times and he felt he was doing very well. He recommended keeping the patient at University Hospitals until he had reached his maximum benefit because he would get no help at home. He said that the father, who is a janitor at the printing company and somewhat dull, had never been able to do very well for the family; the mother is a poor housekeeper, but she had never had much to do with, and the home was about as bad as some of the "out-buildings" on his farm. He said that the patient's twin brother is very wild and a complete failure in school. He had been involved with the law. He praised the fourteen-year-old sister and the younger boys, aged eleven and nine years. He was interested in the vocational plan, but was doubtful that there would be a job in the local print shop because the typesetters had to do their own lifting and carrying.

The patient's progress in prevocational training was average for the first month and then he gradually began to deteriorate. Counselling interviews and interviews by the doctors and social worker were not effective in motivating him. He became more negative, pessimistic, uncooperative, and apathetic. He finally frankly admitted that he was not interested in vocational training and when he was ready to leave the hospital he "just wanted to go home and be a mink trapper."

Another conference of the medical staff, the vocational counselor, the social worker, representatives from the State Division of Vocational Rehabilitation, and from the State Division of Employment Service was held to review the original vocational plan and explore other possibilities. The alternatives suggested were (1) that the patient return to his local community, complete his two years of high school and then consider a vocation, (2) that an attempt be made at direct job placement in an unskilled job where he could be trained on the job. The state vocational counselor was to visit the local community to see what the physical arrangements were at the school, and the state employment worker agreed to try to find a suitable job. In addition, a referral was made to the Minnesota Jewish Vocational Service for help in job placement in Minneapolis.

The patient rejected the idea of returning to school and said he would be truant more than he would attend. He accepted the idea of job placement in Minneapolis, saying that he could get his twin brother or one of his friends to come to live with him. The staff decided to start the patient on a work evaluation program in prevocational training to determine the patient's endurance in a work situation, the length of time he could stand before he became fatigued, and what adaptations would be needed for job performance.

When Donald had completed his medical treatment, he was transferred to a boarding home to continue his prevocational evaluation on an outpatient basis. He went to live in one of the boarding homes used by the hospital, but soon these facilities were found to be inadequate to meet his hygienic needs. He developed an infection, was rehospitalized and at discharge was placed in a nursing home, the expense for both placements authorized by the village council. At this point, the patient was able to walk with long leg braces and crutches on a level surface, and he was able to get up and down stairs with railings. He lacked the body control and confidence to swing on and off street cars or buses or up and down curbs.

The vocational counselor of the Department of Physical Medicine secured a job for him as a contact lens technician for a Minneapolis Optical Company with training on the job at company expense. Donald and a friend, a poliomyelitis victim in a wheel chair and a former hospital patient, found a hotel apartment suitable for their physical needs where they could do their own cooking and laundry by themselves without assistance.

In assisting Donald to make the transition successfully from the security of the protected hospital environment, where he had lived for almost two years, to the insecurity of independent living, several things had to be taken into consideration: (1) supervision in the maintenance of physical health, (2) helping him to perform satisfactorily on the job and to handle his anxieties about meeting new people, (3) helping him to adjust to a new way of living as a severely handicapped person,

(4) assisting him to learn to take care of himself from every standpoint, (5) helping him to secure financial assistance. The doctor, the vocational counselor, and the social worker each contributed in his particular area, with many areas overlapping.

Adjustment to a new way of living, facilitating medical care, and obtaining financial assistance are primarily the concern of the social worker. As a first concrete step, the services of a student dietitian were secured to help Donald and his roommate with food and housekeeping problems.

Assisting with the financial matters was a difficult problem in that the apartment rent had to be paid in advance and the costs of living, including taxi-fare to and from work, met on a current basis. An Aid-to-Disabled grant had been applied for in advance from Todd County and a tenative budget submitted showing the deficit between the cost of living and Donald's earnings. However, no definite action could be taken until the regular board meeting, although verbal committment had been made. This left a gap of about two weeks during which Donald had to finance himself which he could do only by borrowing. His anxieties mounted and he became greatly discouraged. It was necessary to give him much support and encouragement to continue to remain in the city and at his job. In order to provide more adequately, the Todd County Welfare Board requested the Hennepin County Welfare Board to supervise Donald's financial needs and to provide the services that agency could offer to him.

This presentation has been focused primarily on the inter-relationship of the hospital and the community agencies in carrying through a rehabilitation plan for one patient. There is much that could be said about the work of the hospital team with this patient and his social problems in the rehabilitation process.

Much explanation of the staff plan, the prognosis for the patient with and without complete rehabilitation, and the value of timely help was necessary to obtain the assistance from the agencies when it was needed. Although the community agencies wanted rehabilitation for Donald, the expense was hard to accept, particularly the amount needed from the township to supplement his salary.

Donald had a relatively low estimate of himself and his abilities and had little encouragement and help from home. He was a young person, a school boy, who had carried little personal responsibility. He required much help in developing confidence in himself and assuming responsibility for his own planning.

He was easily discouraged with the many obstacles to his progress. Continued support from all members of the rehabilitation team was given to help him carry through in the most difficult and challenging phase of his life.

It is to be anticipated that Donald will continue to have medical problems and problems of growth and adjustment for which the hospital as the medical agency must assume leadership if the goal of restoring to maximum capacity, physically, psychologically, and economically is to be reached.

We have presented the case of Donald Matson to illustrate the need for the assistance of community organization and agencies in the completion of medical treatment plans for people.

CLAIRE E. CENSKY

CANCER OF THE LUNG

Primary cancer of the lung has increased so rapidly that it has now assumed epidemic proportions. Despite the raging controversies in the press, newspapers and scientific journals, the cause of bronchogenic carcinoma still remains unknown. Factors that may be of some importance in the cause of bronchogenic carcinoma are still matters of dispute and no single or multiple factors have been documented as being the cause of primary carcinoma of the lung. This type of carcinoma has no specific or characteristic symptoms. In fact, when symptoms appear, the lesion is often inoperable. Despite early diagnosis and early surgical treatment, the disease still remains difficult to cure or to control. It is well established that most patients with bronchogenic carcinoma are seen by the surgeon too late for any curative procedure to be performed and only palliation may be offered. This unfortunate event is the failure to be constantly cognizant that carcinoma of the lung will, does and can mimic many other intrapulmonary lesions. It can mimic anything from the solitary nodule to tuberculosis. One should be constantly aware of any pulmonary lesion, allowing that it may represent carcinoma. If the lesion fails to follow the clinical course suggested by the original diagnosis, one should institute immediately procedures that would establish the diagnosis as

to whether or not the lesion is malignant. Delay in instituting diagnostic procedures results in the lesion becoming inoperable. It may be stated that any chest lesion is a carcinoma until it is proven otherwise. The constant high index of suspicion that malignancy exists in any lesion in the chest will lead to the early diagnosis of the malignant lesion. In those lesions in which diagnosis cannot be resolved within a short period of time, exploratory thoracotomy is indicated to establish the diagnosis. It should be recognized that there is morbidity with exploratory thoracotomy, but it carries a low mortality rate. It should hold the same position in obscure diseases of the chest as does an exploration in obscure diseases of the abdomen.

In the event that the patient has a solitary nodule or coin lesion, there is only one way to establish the diagnosis and that is by histological study of the removed lesion. It has been well stated that a lump in the lung, like a lump in the breast, is diagnosed only by the pathologist, and the early diagnosis of such a cancer will best be done by remembering its great power of mimicry.

J.F.B.

AMA TO HOLD THIRTEENTH CLINICAL MEETING IN DALLAS

The American Medical Association's thirteenth clinical meeting December 1-4 in Dallas, Texas, will draw some 3,500 physicians, mainly from the southern and southwestern states.

Planned in co-operation with Dallas physicians, the meeting is designed to help the family physician meet his daily practice problems.

Dr. Everett C. Fox, Dallas, is general chairman of the meeting, while Dr. C. D. Bussey, Dallas, is program chairman.

Among the subjects to be discussed on the scientific program are soft tissue injury; whiplash injuries of the neck; diabetes; heart murmurs in children; new laboratory procedures; new resuscitation techniques; premarital and marital counseling, and the problem child.

Dr. Hubertus Strughold, professor of space medicine at the School of Aviation Medicine, Randolph Air Force Base, Texas, will be principal speaker at the opening scientific session December 1. Dr. Strughold, often called "the father of space medicine," will discuss the role of medicine in the space age.

The winner of the AMA's Distinguished Service Award at the Atlantic City meeting—Dr. Michael E. DeBakey—will participate in a symposium on the surgical considerations of cerebrovascular insufficiency Tuesday afternoon, December 1. Dr. DeBakey, chairman of the department of surgery at Baylor University College of Medicine, Houston, was given the award for his outstanding contributions to medicine in the field of vascular surgery.

The scientific program, including lectures, symposiums, medical motion pictures, color television, and nearly one hundred scientific exhibits, will be held in Dallas Memorial Auditorium. Industrial exhibits will number 251.

The auditorium will also house the "world's largest health fair," sponsored by the Dallas County Medical Society in conjunction with the AMA. The fair will run from November 27 to December 7 and will be open to the public.

The fair will feature 150 educational exhibits, prepared by the AMA, allied health groups and voluntary health organizations. They will be manned by members of the Dallas society.

Another special feature of the AMA meeting will be a national conference on the medical aspects of sports, to be Monday, November 30—the day before the AMA meeting opens.

The conference, to be held under the auspices of the AMA's Committee on the Medical Aspects of Sports (formerly the Committee on Injury in Sports) will be open to athletic directors, coaches, and trainers, as well as interested physicians.

The program will cover the general areas of the physiology and pharmacology of exercise, the training and conditioning of the athlete, and the prevention and treatment of injuries.

This is the second time that the AMA has met in Dallas. It held an annual meeting there in 1926. One AMA president has come from Dallas—the late Dr. Edward H. Cary, who was inaugurated in 1932 at the New Orleans meeting.

The AMA House of Delegates, numbering 208, will meet throughout the week at the Adolphus Hotel, meeting headquarters. The first act of the House will be to name the General Practitioner of the Year. The late Dr. Lonnie Coffin, Farmington, Iowa, was the last recipient of the award, given annually to an outstanding American doctor for his medical and civic contributions to his community.

The first recipient of the award was Dr. Archer Chester Sudan, Kremmling, Colorado, who received the award at the first clinical meeting in January 1948 at Cleveland.

The clinical session has been held in St. Louis, Washington, D. C., Los Angeles, Denver, Miami, Boston, Seattle, Philadelphia, and Minneapolis. Physician attendance has ranged from 1,896 at the first Cleveland meeting to 4,427 in Boston.



Eye-catching displays and the activity of glaucoma screening tests attracted large crowds of state fair goers at the Minnesota State Medical Association booth. An estimated 10,000 persons stopped at the booth to receive glaucoma and general health information literature and discuss health problems with attending ophthalmologists and staff personnel.

At the 1959 State Fair

Ophthalmologists Give Glaucoma Screening Tests

A total of 2,950 persons who attended the 1959 Minnesota State Fair received glaucoma screening tests in the Minnesota State Medical Association booth. Activities for this year's project were coordinated by members of the Committee on Ophthalmology; Dr. Robert W. Hollenhorst, Rochester Chairman.

Forty-five possible cases of glaucoma were diagnosed by fifty-seven ophthalmologists, including sixteen residents who co-operated in the project. Fifty-three student nurses from Twin City hospitals and two resident nurses assisted in administering the tests.

The Minnesota State Medical Association booth, a permanent structure, is located at the crossroads in the Education Building on the Minnesota State Fair grounds. The booth was constructed in 1956 at a estimated cost of $1,000.

In 1956, the Committee on Ophthalmology featured a glaucoma display. At that time, state ophthalmologists were present to answer eye care questions asked by the State Fair goers, and glaucoma information literature was distributed.

The following year, the Committee on Conservation of Hearing administered audiometer tests. Sound-proof booths were used and an average of one test every five minutes was given, twelve hours each day for the ten-day event.

Polio shots were given to an estimated 5,000 persons between the ages of twenty-one and forty who attended the 1958 Fair. This project was coordinated by the Committee on General Practice.

The Committee on Public Health Education would like to receive suggestions for a project to be used at the 1960 State Fair.



TONOMETER TESTS were given by participating ophthalmologists who worked in teams of two for a four-hour period. Equipment available at the booth for giving preliminary glaucoma screening tests included tonometers, slit lamps, and chairs. Dr. John L. Bonner, Minneapolis, resident ophthalmologist, is shown giving the eye-pressure test to one of the 2,950 persons who received the tests.

President's Letter

HOW HIGH IS THE COST OF MEDICAL CARE?

The high cost of medical care has been the basis for countless newspaper and magazine articles. The mere mention of "high costs of medical care" will insure readership to an editor. Likewise, the commentator who discusses this subject on radio or television, has a guarantee of a sizeable audience.

Just how high is the cost of medical care? The Bureau of Labor Statistics' figures compared with 1939, show that the twenty year increase for medical care is 106.09 per cent, or one and 99/100 per cent lower than the 108.08 per cent figure for all items. For the same period, food costs rose 149.09 per cent.

What about the cost of non-professional services and commodities? Recently I've found myself paying eighty-five dollars to a television repairman for a new picture tube and installation charges in order to be able to watch the World Series. The Real Estate tax on my home has risen nearly 300 per cent in the past twenty years; the cost of painting the exterior of my house has risen 250 per cent in the past fifteen years.

Everybody knows the cost of a plumber's house call to open a plugged drain. I can't dismiss the $39.50 per year heating service contract. This is exclusive of repair parts. The time spent by a serviceman is less than two hours. Depreciated equipment at the office or the hospital must be replaced. Every physician knows the cost of replacing instruments and examination tables at current prices.

We have been told that in 1933, the man-hours of work needed to pay for a visit to the average doctor's office were four hours and forty-eight minutes. Today it takes only one hour and forty-two minutes of labor to pay for that same visit.

A doctor's house call in 1933 required an average of seven hours and forty minutes wages to pay for that service. Today, the equivalent of two hours and forty-eight minutes is required.

In 1930, the cost of routing a case of pneumonia was $1,000. Today, antibiotics totalling $25 will do the same job.

In 1949, one mg. of vitamin B-12 cost $20. Now its cost is compared to a twenty-five cent bag of jelly beans. A dose of 100,000 units of penicillin cost about $20 in 1943. Since that time, this same wonder drug has decreased in price to approximately seven cents per million units for sterile forms. Today, streptomyocin which cost about $30 per gram in 1945, costs manufacturers eight and one-half cents per gram.

In 1949, there was a price tag of $200 for a gram of cortisone. Today a day's supply of cortisone can be purchased for less than the price of a package of cigarettes.

Many of the diseases which once were "killers" are today's minor illnesses.

Perhaps there is a need for re-evaluation in a generation when Americans are enjoying the greatest economic boom in history. Wages, salaries, dividends, investments and interest rates are ever reaching new plateaus. People are going places and doing things. The upward trend in home-building and remodeling is another evidence of the public's confidence in the economic future of America.

What about the economics of the nation's health? It would appear that we, as the medical profession, have an important public health education job to perform. We must show the public how little good health really costs.

Sincerely,

Benjamin B. Foulston M.D.

President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

ADMINISTRATION EXPRESSES STAND ON FORAND BILL

One of the significant results of the recent House Ways and Means Committee Hearings on the Forand Bill was the stating of the administration's position on H.R. 4700. At that time, Secretary of Health, Education and Welfare, Arthur S. Flemming, the first witness at the hearings, made clear the administration's postion, which, until that time, had not been known.

Secretary Flemming summarized the administration's position in these words.

"*We must come to grips* with the problem of providing adequate hospital care for the aged.

"The percentage of aged persons covered by *hospital insurance* written by non-profit groups and insurance companies has increased in a very significant manner in recent years.

"There is every indication that the percentage of aged persons covered by hospital insurance written by non-profit groups and insurance companies *will continue to increase.*

"The enactment of a compulsory hospital insurance law would represent *an irreversible decision* to abandon voluntary insurance for the aged in the hospital field and would probably mark the beginning of the end of voluntary insurance for the aged in the health field generally.

"Instead of abandoning voluntary hospital insurance for the aged in favor of compulsory insurance, every possible effort should be made to determine whether or not a plan can be developed that will *strengthen the voluntary approach* by making adequate protection available to a larger percentage of the aged."

No action is expected on H.R. 4700 during the remainder of this Congressional session.

MD OFFERS FORAND "PRESCRIPTION"

Physicians are devising new ways to help congressmen reach decisions concerning H.R. 4700, reports *MD* (Medical Legislative Digest), published by the Council on Legislative Activities of the American Medical Association.

According to the report, Doctor Charles G. Smith of Arlington, Virginia, sent the following message to members of Congress on his regular printed prescription blanks.

"If you feel a temptation to vote for the Forand Bill, please call me at once (any hour of the day or night) and I'll be glad to come and sit with you until you feel better."

MD points out that one Congressman, Representative Wright (12th District of Texas) not only called it "One of the cleverest things I've seen along this line" but he had also promised to oppose the bill.

KEOGH-SIMPSON HEARINGS END

Senate Finance Committee Hearings on the Keogh-Simpson Bill, H.R. 10, concluded on August 11.

Twelve witnesses testified on the first day of hearings in support of the bill. Senator Moss (D. Utah), the first person to testify, pointed out that it was imperative that the measure should be enacted during the 86th Congress. Support was given to the measure by a representative of the National Live Stock Tax Committee who pointed out that he was disturbed to find that the bill had been criticized as being sponsored only by doctors, lawyers and a small group of businessmen. He could not understand why farmers and ranchers had not been included as sponsors of the bill since they represented one of the largest groups of self-employed and have been on record as approving the bill for some time.

Congressman Keogh, co-sponsor of the bill, was the last witness to appear before the Committee. He argued against a proposed amendment which would force a self-employed individual to set up a plan for his employes in order to take advantage of the self-retirement plan.

NEW DEFINITION OF DISABILITY HEARING ASKED

Senator Estes Kefauver (D., Tenn.) has introduced S. 2459 which would amend the Social Security Act to preserve the insurance right of individuals who, because of disability have lost at least sixty per cent of their earning capacity.

Under present law, disability is defined as the inability of an individual to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment which

can be expected to result in death or to be long-continued and of indefinite duration. This bill would expand the definition to include an individual who has lost at least sixty per cent of his earning capacity because of a physical or mental impairment.

SENATOR MORSE ATTACKS ORGANIZED MEDICINE

One of organized medicine's severest critics and Senate sponsor of the Forand Bill, has been at it again.

In one of his latest Senate floor speeches, Oregon's Democrat Senator Wayne Morse has challenged the AMA to try to defeat him. In the opening remarks of his speech, Senator Morse named the AMA as the "chief lobbyist" against his bill. He also accused the AMA of using "false propaganda" to defeat the Forand Bill. He branded as "poppycock" any fear that providing medical care to the aged through the social security system would lead to socialized medicine.

Following are the pro-Forand Bill remarks of Senator Morse's speech delivered August 6, 1959.

"Let me say to the doctors of America, I am not worried about any danger of socialism in American medicine, but I will tell the doctors of America what I am worried about. I am worried about undue commercialization in American medicine.

"I care not what the political effects may be on the senior Senator from Oregon as a result of these remarks. If the doctors think they can defeat me, I ask them to come to Oregon and try. They are going to discover that the people are with me.

"Increasing millions of people in America are going to be with those of us who recognize the great moral obligation to the aged of this country as the years go by. We must take away from the doctors of America the right to tax, which they now exercise. They exercise it under the guise that they think they should be allowed the right to impose certain fees upon those who they think are better able to pay higher medical fees, in order to take care of the medical cost to patients the doctors serve who cannot pay such fees.

"That principle being followed by the medical profession in America has no place in America. I deny that the Government should tolerate the kind of medical fee tax policy practiced by the American medical profession. The American medical profession should charge reasonable fees—and I want them to have reasonable fees. They will find that no Member of this body can be counted upon more certainly to protect the right to the private practice of medicine than the Senator from Oregon. There is not a syllable in my bill that infringes upon the right of doctors to engage in the private practice of medicine free of any threat of socialized medicine. What my bill proposes is to see to it that the aged people have the wherewithal to pay the private doctor of their own selection to treat them in their declining years. That is not socialism. That happens to be putting to work the great religious principles that we profess, but, too frequently, I am afraid, do not practice.

"There is house-top after house-top, by the thousands in our country today, covering the heads of millions of old people over sixty-five, who are living under the gnawing fear that a serious illness will wipe out such little earnings as they have been able to save, and impose a tremendous financial burden upon their children or other relatives to take care of them in years of illness.

"I happen to believe that the time has come to face up to this issue in America, and proceed to recognize that there is a responsibility on the part of the people of the Nation as a whole to provide legislation which is necessary, such as the bill I propose, to pay for the expenses of such illness through social security. There is needed legislation which will make it clear to the medical profession that we will protect them in the right to the private practice of medicine and at the same time protect the American people from undue commercialism in medical costs.

"I think we should draft a bill along the lines of the bill I am now offering, which leaves no room for doubt that we are protecting the private practice of medicine, but also makes it perfectly clear that we have the responsibility to enact legislation which will assure the aged in this country that they do not have to look forward to the declining years of their life under a gnawing fear that they will not be able to get the medical attention they need.

"Although reactionary doctors will not approve nevertheless I take the position—and let us take the issue to the crossroads of America—that the medical profession does not have the moral right to charge whatever fees it chooses to charge. On the contrary, the Government has the duty to impose restrictions upon the medical profession similar to the restrictions we have imposed upon other economic groups whenever an economic group takes advantage of the people.

"In my judgment we must face up to the question of medical costs. I have been at work for months in preparation for the hearings to be conducted by my subcommittee of the Committee on the District of Columbia, in regard to medical costs in the District of Columbia. I had hoped, and I still hope, that we may be ready for those hearings before Congress adjourns this month. But if we are not, we will proceed with them this fall, or at the beginning of the next session of Congress.

"I believe that the doctors themselves are drawing this issue. I am for meeting the issue, and for placing in effect Government regulations necessary to give to the people of the country the protection which I have come to believe they are entitled to, from excessive medical costs and hospital costs."

DOCTOR LARSON ADDRESSES GROUP HEALTH ASSOCIATION OF AMERICA CONFERENCE

Dr. Leonard Larson, Chairman of the American Medical Association's Board of Trustees and Chairman of the Council on Medical Care Plans, was a participant in the recent Group Health Association of America Institute held in New York City.

The occasion marked the first meeting of Group Health Association of America, an organization formed as the result of the merger of the American Labor Health Association and the Group Health Federation of America.

The GHAA publication commented "for the first time in the history of the GHAA Institute, an official of the American Medical Association participated, marking a new line of communication with organized medicine."

Doctor Larson described the AMA's "continuing battle for the improvement of the quality of medical care." He pointed out that AMA's contribu tions include "standards it has approved and urged in medical education, hospital accreditation, licensure, and specialty training." Doctor Larson also cited the grievance and third-party liaison committees organized by many medical societies to handle over-charge complaints and assure quality of medical care.

He brought to the attention of delegates, the new AMA Medical Disciplinary Committee whose purpose is to "uncover areas where disciplinary measures against 'poor practitioners' may be most needed." The AMA spokesman emphasized that the patients' reaction to the type of care he receives is important in measuring quality of care. According to Doctor Larson, "a patient may receive a maximum of benefits medically or surgically, but still feel psychologically that he has not been helped. The doctor is concerned with more than a patient's physical needs, but he also must be concerned with emotional and psychological aspects of the individual as they relate to, or have an effect upon, illness or disability."

Union and Closed Panel Groups Review Medical Care Plans.—Delegates attending the first Institute sponsored by Group Health Association of America in New York City, heard representatives of labor, lay sponsored group health care plans, and government, present their views regarding medical care plans.

Humphrey Speaks.—Senator Hubert Humphrey (D., Minn.) was introduced by Mrs. Eleanor Roosevelt as a GHAA Institute luncheon speaker.

According to the *GHAA Newsletter,* Senator Humphrey called for legislation to provide hospital and nursing home care to aged persons through social security. He further pointed out to the group that aged people will still need a total health program "to keep them *out* of the hospital and functioning in their home and in the community." Senator Humphrey also told the luncheon audience that legislation should encourage voluntary action in experiment with medical care organization and financing. He described a bill which he introduced in Congress to provide long-term loans for the establishment of group practice facilities for voluntary non-profit pre-paid health plans.

Dollars and Medical Care.—AFL-CIO Secretary-Treasurer, William F. Schnitzler, one of a broad range of speakers which GHAA Delegates heard, stated "doubling the premium does not double the financial protection, and doubling, tripling, or quadrupling the premium may very well do nothing at all to improve the kind of medical care that people get. The vast bulk of medical expenses remain uncovered."

According to the GHAA summary of Mr. Schnitzler's remarks, organized labor will continue to co-operate with established health insurance plans, but "will work increasingly in the future directly with physicians and hospitals" to achieve comprehensive medical care plans. Mr. Schnitzler also demanded the elimination of economic barriers for members seeking needed medical care.

"State legislation that restricts the free development of responsible attempts by people to organize together to meet their medical needs must be wiped off the books," said Mr. Schnitzler. "There is no justification for the continued existence of barriers to the establishment and growth of all but a few specified kinds of prepayment plans."

He also called for "unfettered experimentation and exploration" to develop organizations that can provide high quality medical care at a reasonable cost.

Cars that did not have the right of way injured 608,400 and killed 3,890 persons on U. S. Highways in 1958.

Public Health

BIOLOGICS FOR IMMUNIZATION DISTRIBUTION POLICY DESCRIBED

In order to provide immunizing materials to accomplish the most widespread coverage within available appropriations the State Board of Health has set up the following policy.

Biologics for immunization distributed by the Minnesota Department of Health are primarily intended for use in school and community immunization programs organized in co-operation with the local medical society. Immunizing materials for these programs will be supplied to physicians as in the past within the limits of available supplies. Such materials will also be supplied to physicians for private patients who cannot afford to pay for the vaccine. Since the vaccine is supplied without charge to the physician no charge to the patient shall be made for the material. The physician, however, is entitled to make a modest charge for the service.

Immunizing materials for state institutions including educational institutions will no longer be supplied from this department since these institutions are eligible to purchase vaccine at the same favorable prices as this department. State agency purchases should be made through the Division of Procurement, Department of Administration, State of Minnesota (Annual biological price agreement covering period July 1, 1959 to June 30, 1960). The State Board of Health strongly recommends that such institutions in no way curtail their immunization programs.

Old Tuberculin for Mantoux testing will be supplied on request as in the past. Gamma globulin for prevention and modification of measles and for the prevention of infectious hepatitis in household contacts will be supplied as in the past as supplies permit. Gamma globulin is supplied free of charge by the American Red Cross on an allocation basis to the various states. No charge should be made for this material, but a service charge may be made for administration.

Biologics distributed by the Minnesota Department of health for immunization and/or treatment include:

Diphtheria
Antitoxin* (in vials of 1,000; 10,000; 20,000 units)
Diphtheria antitoxin also available from antitoxin stations maintained in all parts of the state
Diphtheria-Tetanus toxoid, A.P. (Pediatric)
Diphtheria-Tetanus toxoid, A.P. (Adult)
Diphtheria-Tetanus toxoid, A.P. with Pertussis Vaccine (triple antigen)
Schick test material (limited supply)

Infectious hepatitis
Immune serum (Gamma) globulin* (for household contacts only)

Measles (Red measles only)
Immune serum (Gamma) globulin* (for modification or prevention of measles in children four years of age and under. *Not* furnished for pregnant women exposed to German measles)

Pertussis
Hyperimmune serum* (for treatment of sick children under eighteen months of age)
Diptheria-Tetanus toxoid, A.P. with Pertussis vaccine (triple antigen)
Pertussis vaccine, A.P.

Rabies
Antirabies serum* (for emergency use in severe bites of head and neck in conjunction with antirabic vaccine. Antirabic vaccine is not supplied but is available commercially)

Smallpox
Smallpox vaccine

Tetanus
Tetanus toxoid, A.P.

Tuberculosis
Tuberclulin (dilutions 1:100, 1:1,000, 1:10,000)

Typhoid Fever
Triple typhoid vaccine

*Limited supply and outdating of biologics permits distribution only for immediate use.

LEVELS OF STRONTIUM 90 IN WATER COURSES

The Public Health Service reported today on the levels of strontium-90 in the Nation's major water courses.

The figures, based on weekly samples from fifty-one stations, are very substantially below the levels which the National Committee on Radiation Protection and Measurements considers permissible for life-time exposure by the general population.

Based on weekly samples from the stations, the data are part of the information being gathered on stream pollution by the national water quality network operated by the Public Health Service. The network includes seventeen major rivers.

The study will eventually provide precise measurements of all important forms of pollution in the Nation's water resources, including the presence of plankton, and the general chemical, physical and bacteriological characteristics of major rivers and streams.

The water quality network, operated in co-operation with State and local governments, universities, and industry, was established in 1956 on recommendation of the President's Advisory Committee on Water Resources Policy. The present 51-station network is expected to increase to 75 during the coming year and will eventually include 250 stations.—U. S. Department of Health, Education, and Welfare, Public Health Service, Washington 25, D. C.

The Art of Medicine

PR

Carl H. Woyke, B.A.
Editor

GOVERNMENT MEDICINE—A "FREE" RIDE?

Three different views on governmental control of medicine were presented at the Thursday morning session, "Buy Your Own Ticket—or Get a 'Free' Ride?"

A German, a Canadian and an American summarized the dangers of socialized medicine on the basis of their individual backgrounds.

The speakers were Rolf Schlogell, M.D., of Cologne, Germany, Secretary-General of the Organization of German Doctors Engaged in Health Insurance; B. E. Freamo, Toronto, Assistant Secretary (Economics), Canadian Medical Association, and Claude Robinson, Ph.D., Princeton, N. J., Chairman of the Board, Opinion Research Corporation.

Doctor Percy Hopkins, Chicago, a member of the AMA Board of Trustees, moderated the discussion.

Already Too Resigned?

Doctor Schlogell warned that "We have already resigned ourselves in too great a degree to our fate by complying with the complicated machinery of today's social life in surrendering our individual freedoms in order to guarantee a frictionless living together as a whole.

"Already many of us," he continued, "have in this way lost the ability to judge whether or not the abandonment of rights and freedoms is worth the personal price we pay."

The German pathologist devoted most of his remarks to a critical analysis of governmental health services, which he defined as "an institution that grants protection against disease to every citizen of the country, financed . . . from the state budget."

Government Can't Be Neutral in Health Field

Because of the state's position in the health insurance of a nation, Doctor Schlogell said, "it automatically loses its neutral position as a mediator between the groups or between individuals."

Under government health systems, he pointed out, "four freedoms are restricted:

"1. The freedom of the patient to choose the doctor in whom he has confidence.

"2. The freedom of the doctor to refuse further treatment to the patient if the confidence each has in the other—the psychological basis in the healing of illness—is destroyed.

"3. The freedom of the doctor to practice his profession according to the rules of medical art and science—free to select the suitable techniques in diagnosis and therapy and to reject those that are unnecessary or even detrimental.

"4. The freedom of supervision of the doctor by professionally qualified groups—free from the authoritative influence of laymen."

Mr. Freamo described the attitudes of Canadian physicians to government medical control by the phrase, "It can't happen here."

During the past two years, however, "we have had to face reality: it can happen here," he said.

"Governments have become more fiscally irresponsible," he continued. "They no longer hesitate to implement a program just because we can't afford it. These

reasons suggest the possibility that governments might, for reasons of political opportunism alone, implement a program of medical care insurance."

In Canada, he said, a system of federal government support of hospitals has won "widescale public approval." Although the Canadian Hospital Association "has gone on record as approving the plan," Freamo noted that "the attitude of the medical profession varies widely."

Medicine Must Keep Abreast of the Times

He urged against anything which might deteriorate the quality of medical care or interfere with medical progress.

"I cannot foresee that the art of medicine can possibly be enhanced under the conditions which must eventually be associated with government control. Further progress in the quality of medical care is not consistent with a program which must stress equality of care."

Doctor Robinson said that since "change is the order of the day" in American society, the medical profession "should anticipate change and lead it."

"The status-quo is yielding everywhere," he observed.

Medical Services Must Be Improved

The immediate goals of both medical societies and individual physician, in Doctor Robinson's opinion, should be "to improve services and cut down on complaints.

"Study the needs of the people—then meet them," he urged.

"Every doctor must understand the public view as well as his own view."

He suggested that physicians look on the struggle against socialism as basically "a merchandising problem."

Study Needs of the People

"The key to successful selling is to study the needs of the people, show how your product is better than the competition's, and get your product before the people.

"Your product is medical leadership—the doctor-patient relationship."

Government is Medicine's Number One Competitor

He warned that "The competition in the medical marketplace today is offering an attractive bill of goods."

The principle competitor, the federal government, was described by Doctor Robinson as "a clever competitor—one that says it will give the people something for nothing."

He pointed out that the government already has prepared "a health package for the veterans, a package for the old people. If they are successful with the old people, then they will have packages for infants, teenagers, newly-marrieds, then complete socialization of health care."

The government, he said, "is emphasizing the positive approach and is using what we call the 'Hard Sell' on the public."

OFFER HEALTH MATERIALS TO PTA GROUPS

Is there a PTA or some other community organization which could use health information material? Why not contact these organizations in your community to see if you or your county medical society could extend this service.

Your state office has adequate supplies of many AMA health education materials on hand. Others can be ordered if required.

Materials available include: "What Everyone Should Know About Doctors"; "Health Services School-Age Children Need"; "The Best Defense Against Sex Perverts"; "Let 'Em Eat Hay"; "Personal Health Information Record"; "Beware of the Healer who Guarantees a Cure, He May be a . . . 'Quack' "; "The Merchants of Menace"; "To All My Patients"; "The Healthy Way to Weigh Less"; and "Your Family Health Record".

Samples of these will be sent upon request.

History of Medicine in Minnesota

PIONEER PHYSICIANS OF STEVENS COUNTY, MINNESOTA

JOSEPHINE EDDY, GRACE HALL
A. I. ARNESON, M.D.
Morris, Minnesota

ROBERT ROSENTHAL
Saint Paul, Minnesota

Stevens County was established by an act of the legislature on February 20, 1862, and was named in honor of Isaac I. Stevens who headed a commission in the late "fifties" for the survey of a line of railroad from Minnesota to the Pacific Coast. An old trail from the Selkirk Red River settlements to the Mississippi River posts passed through this area. Before that, it had been a favorite hunting ground of Indians. There is no record of any settlements before the Indian Massacre of 1862 which stopped all travel and immigration.

An Indian scare came in 1868 when the Sioux and Chippewas were in conflict. Near the Lake Crissey Park the Sioux killed one of their own squaws who had married a Chippewa. A battle was fought and a number of Indians were killed and buried near there. Governor Austin sent out military supplies: Stevens County was assigned to Company H, First Regiment, with John Folsum as Captain. It was later used by soldiers on frontier duty who used it as a camping ground. When peace was established, travel was resumed by stage lines on the trails, and some of the soldiers returned as settlers.

Gager's Station was made a stopping place, trading post and, later, the temporary county seat. On the trail of the Minnesota Stage Company, and built in 1866, it consisted of a boarding house and sleeping quarters for travelers, barns and a residence for the family—all built of logs. The station was the stopping point for stages running from Sauk Center to Fort Wadsworth, now Fort Sisseton. Four horse stages covered the trail which was also used by oxcarts three times a week. All supplies were brought from Sauk Center. The first saloon was established at Gager's Station, with a barrel of whiskey and a tin cup as its equipment.

The first settlements of which there is authentic record were made in the township of Framnas in 1866. Among the first settlers were a number of men from the East and South who had money they wished to invest in this new country. Most of them bought tracts of several thousand acres of land and started "bonanza wheat farms." Dr. Heenan of Pennsylvania and Dr. Sutherland of New York were among these investors. When the wheat ventures failed to make expected returns these men turned to their professions or to other businesses or left the county. Their farms were broken up into small tracts.

Data for this history were collected from the files of Stevens County newspapers: *Frontier Business*, J. C. Chandler and J. P. Cooper, editors and publishers, which became the *Stevens County Reporter* in November, 1876, W. H. Graves, Editor and Publisher; which was succeeded by the *Stevens County Tribune*, April 8, 1880, W. J. Munroe, Editor and Publisher. Other information was obtained from the Illustrated Album, Biography of Pope and Stevens Counties, published in 1880; Historical Contributions by Calvin L. Brown, Chief Justice of the Minnesota Supreme Court; National Archives and Records Service, Washington, D. C.; drug store files; office of the Minnesota State Medical Association, county office records, and from some of the oldest settlers of whom very few are left.

The first post office in the county was Scandia in the township of Framnas; later, mail was distributed at Gager's Station. In 1871, with the coming of the St. Paul and Pacific Railroad, the post office was transferred to Morris. From 1876-1887 a government stage was run between Morris and Alexandria with Nash in Framnas Township as a post office.

The first general election was held at Gager's Station in 1868; about twenty-five legal votes were cast and returns made to Pope County, and in that same year the present boundaries of Stevens County were set, although a permanent organization was not made until 1871.

The early settlers were exposed to all the trials and hardships incident to life and home-making in a new county. Those who came to Stevens County prior to 1873 were exposed to one of the worst storms experienced in this section. It is referred to as "the great blizzard of January, 1873" which continued with tremendous force and violence for three days and nights. The storm came from the northwest and extended over the entire prairie from the northern boundary of the state to Rock County. It left in its wake many who were caught in its fury and were frozen to death, and many others, who, though their lives were spared, lost both hands and feet, frozen to an extent that made amputation necessary to save their lives.

Grasshoppers were a serious plague from 1875 to 1877, and proved a severe set-back to the new country. Many settlers left and others took up trapping. Early settlers say that eagles, pelicans, elk, deer and buffalo were plentiful.

Morris was named after the chief engineer of the first railroad to come through the town. Chokio is an Indian name meaning halfway. This was the halfway point on the stage route between Gager's station and Lake Toqua, now Graceville. Hancock was named in honor of Rev. Joseph Woods Hancock, an early missionary among the Indians and settlers of Goodhue County, from where many of the early families of the Hancock community came. The town of Donnelly was first named Douglas. The change to Donnelly in 1877 was in honor of Hon. Ignatius Donnelly who owned a large farm near the village, who was elected lieutenant governor and served in Congress from 1863 to 1869.

Between 1871 and 1875, the village of Morris had a fairly rapid growth for a new frontier community. The census of 1875 gave the town 480 people. The Federal census of 1880, five years later, gave the village, exclusive of the people of the township, a population of 780. Morris was incorporated in 1878. There were no street lights except three dingy kerosene affairs supported by individuals. Streets were in bad condition. In early spring Atlantic Avenue was practically impassable for a time because of muddy conditions. The present pavement is quite in contrast with the streets as they existed in former days.

Frontier Business was the first newspaper published in Stevens County. Volume I, Number One, was issued August 4, 1876. It carried in its mast head the notice of "Republican in politics, respectable in fun and remarkable in frankness. All for two dollars a year, invariable in advance, which is business." A general feature of the early papers was the advertising of patent medicines, describing in detail such illnesses as consumption, a cold or sore throat, pimples, ringworms, catarrh, a terrible cough, et cetera.

All through the years a concentrated effort was evidently made through the papers by the Board of Health to prevent unnecessary illnesses; they urged the removal of all filth, garbage, and trash to designated dumping grounds.

In the early days sulphur and molasses, the old-fashioned antidote for spring use, the pain killer, the much-advertised cure-all "wizzard-oil" and other liquids

took care of most ailments with which both old and young were then afflicted.

City Drug Store (F. M. Terle & Co.), located on the west side of the tracks, carried the first drugstore advertisement in Stevens County, appearing in *Frontier Business,* Vol. I, No. 2, issued August 11, 1876.

Dr. E. R. Wait was the first doctor in Stevens County of whom a record has been found.

In the files of the present Arneson Drug Store, Prescription No. 1 was written on February 26, 1880, for Quinine-Sulphate and signed by Dr. Thomas Heenan. The patient's name was not given. Prescription No. 2 was written by Dr. D. R. Sutherland and No. 3 by Dr. H. L. Hulburd.

Morris suffered a measles epidemic in 1888 and a "La Grippe" epidemic in February, 1890, according to the State Board of Health.

The following is taken from a report of the Secretary of the State Board of Health, dated December 31, 1898, published in the *St. Paul Medical Journal,* 1:107-108 (Jan.) 1899.

"In 1898 Morris had what is called an unnecessary epidemic. The health officer, Dr. Hulburd, diagnosticated certain sore throat cases in his practice as diphtheria. Other physicians with similar cases called the disease tonsillitis and opposed quarantine. On October 27, I received an urgent call to visit Morris and investigate. Eleven of the twelve cultures showed diphtheria. The most pronounced case was a young school teacher. She was sick one week and the doctor insisted she did not have diphtheria. On October 28 a typical membrane and culture were positive." Morris had thirty cases of diphtheria from September 1, 1898, to December 9, 1898. "There was a great deal of acrimony displayed in Morris." The schools were closed at two different times—in all, twenty days.

In September, 1899, all school children were vaccinated for smallpox. The following excerpt is from the *Morris Tribune,* September 16, 1899: "The latest method of putting up vaccine virus is in tiny tubules, instead of on celluloid points. This keeps the virus in liquid form until applied—."

In 1876, Dr. Wait came to Stevens County as the only doctor to serve approximately 300 widely scattered people. From then until 1900 a record has been found of twenty-six physicians having practiced in the county, some staying only a short time. In the December 30, 1899, issue of the *Morris Tribune,* the professional cards of Drs. Hulburd, Spurr, Young and Caine were listed. They, with Dr. Cuff of Hancock, served the 18,721 people then in Stevens County.

"Mrs. Dr. C. A. Bennett, M.D.," is mentioned in a local newspaper, dated November 20, 1879, which states that "she will be at the Evans House and asks a share of patronage." An ad which appeared on the same date states that she is from Minneapolis and Detroit, Michigan, that she had twenty years' experience in many diseases, that she is one of the most successful lady physicians in practice, and that she also is the owner of a business manufacturing cough-drops and lozenges. Her ad continued until the end of March, 1880. Nothing more is known of her. No doubt she was an itinerant physician or a quack.

Dr. Charles Edward Caine was born on a farm at Spring Brook, near Princeton, Minnesota, on May 25, 1868. His father, Thomas Caine, and his mother, Anna Tuttle (who lived past the age of ninety-seven) were born in New York. During his boyhood years he knew the hardships of pioneer life. As a young man he taught school for several years to prepare himself financially for medical school, as he had already decided to devote his life to the service of his fellowmen through the science of medicine. He worked his way through the University of Minnesota

and was graduated in 1896. In that same year he began his practice in Elbow Lake, Minnesota. Also, that same year he was united in marriage to May Martin, the wedding taking place at Sauk Rapids on December 31. In December, 1898, he came to Morris and opened an office over Krueger's Drug Store and continued the practice of medicine in the community until his death.

During his forty-five years as a physician in Stevens County, he won to an unusually high degree the trust and confidence of the families he served. He gave readily and unselfishly of his skill and knowledge, of his patience and understanding. He showed the same consideration to all of his patients no matter what their station in life. Through the years of his practice, Dr. Caine placed his own life in jeopardy on many occasions in answering the call of his patients, especially in the winter months when blocked roads, blizzards and subzero temperatures were grave threats to travelers.

In 1925 he established the Morris Hospital in Morris, and owned and operated it successfully to the great benefit of the community. In 1951, it was merged with the Stevens County Memorial Hospital.

Dr. Caine was always interested in public affairs, local as well as state and national. His prime interest, however, was Morris and its surrounding territory, and he gave generously of his time, effort and money to its progress. He was definite and outspoken in his beliefs, but even those who did not share his viewpoints heard him with respect and regard.

Dr. Caine held many positions of trust and responsibility in Stevens County. In 1936, he was elected to the City Commission and re-elected in 1940. Two years later (1942) he resigned from the commission and was elected mayor, a position he held at the time of his death. Both posts were filled capably and efficiently. He served as county physician, as county coroner for sixteen years, as city health officer and county health officer for many years. He was a member of the Board of Education and served as president of the board. He had been physician in Morris for both the Great Northern and Northern Pacific railways.

Dr. Caine served for a number of years on the State Board of Medical Examiners and was president of the body for a time. During World War I he was Stevens County examining physician under the Selective Service Program.

Dr. Caine was a charter member of the West Central Medical Society and was a member of the Minnesota State Medical Association and the American Medical Association. He was a member of the Golden Sheaf Lodge No. 133 A.F. & A.M., of Mt. Lebanon Chapter No. 47, Royal Arch Masons, and of Bethel Commandery No. 19, Knights Templar. He was a member of Morris Aerie No. 620, Fraternal Order of Eagles, and was a charter member of the Morris Civic and Commerce Association.

Dr. Chas. E. Caine passed away at the Morris hospital on Saturday morning, April 15, 1944, from coronary thrombosis. He had been in failing health during the previous winter, but there were comparatively few days he was not at his office, attending to hospital duties or making calls throughout the countryside. The same dogged determination that often, during half a century of medical practice, had stood him in good stead as he battled illness and the threat of death among his patients, kept him at his work during the last months despite his poor health. Those last days were as he would have wished them—busy at his chosen work until only a day or two before death came.

Few persons have been so generally mourned in the community as Dr. Caine. The news of his passing spread quickly over a wide territory, and the grief which it occasioned is that which comes only with the loss of a very close, esteemed and

helpful friend, one who has earned a place of honor through a lifetime of service to his fellowmen. Impressive tribute was paid to Dr. Caine at the funeral services held in the Morris Armory. Every available seat in the large auditorium was filled by those from every part of the county and greater distances. It was the largest crowd ever to attend a funeral in Morris. The funeral services were conducted by Rev. E. S. Ede, pastor of the First Lutheran Church. He struck a responsive chord in the hearts of his listeners with his eulogy of Dr. Caine's life of service. He was buried in Summit Cemetery, and Masonic services were conducted at his grave.

Dr. Caine was preceded in death by his wife, who passed away on March 15, 1930, and by a son, John A. F. Caine. Left were a daughter, Mrs. Lois Caine McElligott of Morris; a sister, Mrs. Herbert Howard of Sebeka; a brother, Fred W. Caine of Ritchie, Saskatchewan, Canada; a niece, Mrs. Fred Orth of Grand Forks, N. D., who was reared by Dr. and Mrs. Caine; and a granddaughter, Sheila McElligott. Mrs. McElligott and daughter later moved to Minneapolis.

Dr. William S. Cuff came to Hancock in 1897 shortly after his graduation from the University of Minnesota in the same year. In 1898 he planned to move to Morris, but nothing came of it. Close to the turn of the century, he located in Benson, Swift County, and stayed for almost a year. He returned to Hancock in the summer of 1900. A local newspaper in February mentioned the need for a physician in Hancock and an item of April 28 announced that "Dr. Cuff decided to return to Hancock. . . . Dr. Daignault will take up Dr. Cuff's practice in Benson."

Dr. Cuff was a busy practitioner in Stevens County; many incidents of injuries and illness attended by him are mentioned in the newspapers. When he left, the *Morris Tribune* of May 2, 1903, gave him a fine send-off: "Dr. and Mrs. Cuff left for St. Paul, their future home. . . . Hancock cannot afford to lose such of her citizens neither in a social nor in a business way, and many friends will regret their departure. . . "

In St. Paul he formed a partnership with Dr. B. J. Hawkins, and practiced for many years with an office on Wabasha street. He joined the Ramsey County Medical Society not very long after his arrival in St. Paul (on October 26, 1903), but apparently did not remain a member for very long nor take an active part in it. He retired in 1943 and is still (1957) living in St. Paul.

Dr. Cuff was born in Nobles County, Minnesota, in 1875, but left that county at the age of about ten. He graduated from University of Minnesota Medical School in 1897.

Dr. Stephen H. Duley was born in Russia, Herkimer County, New York, June 8, 1828,* the son of Benjamin and Amy A. (Harmon) Duley. At the age of fifteen, he started in the world by himself, leaving home in the most destitute condition. He had no resources but in himself, and acquired his education by studying at night. He attended an academy for a few months but was unable to continue on account of lack of means.

For the next four years after leaving home, he was engaged at whatever he could find to do, and only by hard work and economy was he able to succeed. At the age of nineteen, he commenced the study of medicine at Plessis, Jefferson County, New York, with Drs. Hutchins and Hosford. After being with them one year, he was married to Miss Phoebe Fox of the same county. They moved to

*His obituary in the *Morris Tribune* gave June 9 as the date of birth.

Gravesville, Wisconsin, where Dr. Duley entered upon clinical work with Dr. Alden and studied and practiced at the same time with Dr. Alden. Five or six years later he moved to Westfield, Marquette County, Wisconsin, and shortly thereafter went to Chicago and attended Bennett Medical College. He was graduated from this college in 1878, and returned to Westfield and again opened an office. He remained there until 1882 when he came to Minnesota and opened an office at Benson, Swift County, where he practiced until November 28, 1883, when he came to Morris, Stevens County. His professional card in the *Morris Tribune* read as follows: "Dr. S. H. Duley, Physician and Surgeon. Office over Larson and Nelson's Store. A graduate of Bennett Medical College, Chicago, Illinois. Twenty-five years' experience in constant practice. Female diseases a specialty."

Dr. Duley's living quarters were in the rear of his office. His practice gradually increased and he was considered to be one of the successful practitioners of the county.

Dr. Duley was rather eccentric. His hair was very white and wavy and he wore it in long ringlets hanging on to his shoulders. Around town he wore a long frock coat, a tall silk hat and gloves, and carried a cane. He told Dr. Caine of a severe case of postpartum hemorrhage, several years before in some back woods in Wisconsin. It was in the winter time, so he and the woman's husband carried pails of water from a near-by spring and poured it over the poor woman all night long and finally stopped the hemorrhage.

In his politics, Dr. Duley was a Democrat. He was elected delegate to the Democratic State Convention in June, 1898. He served as health officer for several years and received recognition many times for the manner in which he kept the city clean and free from weeds, for inducing the Great Northern Railway to drain their right of way between the depot and Atlantic Avenue, and having the place filled and leveled. Later, he was removed from the position of health officer by the village council for refusing to co-operate with the mayor and council on quarantine. He was appointed examining physician for Stevens County by the Commissioner of Pensions and was county coroner for some time.

In 1889, Dr. Duley filed a homestead entry on the lake, two and one half miles from town on the Graceville road, and he was given credit for good business sense. In August, 1900, his office was destroyed by fire (he had had the same misfortune once before, losing his library, instruments, et cetera). This time, too, he lost his library and his whole equipment. He was overcome by smoke trying to save some of his belongings. The loss hit him hard, as he carried no insurance.

In 1891, he moved back to Benson, but this was not a lucky move. In July, he spent almost a month ill in a St. Paul hospital and in August of the same year he returned to Morris where he rented an office over J. J. Carney's meat market. In 1892 he built an office on Fifth street, opposite Cline and McDonald's meat market.

Dr. and Mrs. Duley were the parents of five children, only one of whom lived; she was Ala M. who married Levi A. Smith of Westfield, Wisconsin.

Around 1896 Dr. Duley's health began to fail to the extent that he had to employ an assistant. Finally, in the early part of 1903, he had to give up his practice and go to Spencer, Iowa, where his daughter lived. In November, 1903, Dr. Duley was brought back to Morris as his relatives in Iowa refused to take care of him. He was very low physically and had to be cared for by the county.

He died a short time later of cirrhosis of the liver, and was buried from the Assumption Church. His obituary appeared in the *Morris Tribune* of December

26, 1903, which stated at the end "Though never prominent in the profession here in Morris, his condition excited the sympathy of many friends, so that in his sickness he was cared for and given a Christian burial."

Dr. John O. Dyrnes practiced in Morris only a short time—from December, 1898, to February, 1899. His career as a missionary physician in Madagascar, however, is sufficiently interesting, to permit a somewhat extended biographical sketch. After his graduation in 1898 he located for a short time in Hanley Falls, Yellow Medicine County, for which reason his biography is included in the medical history of Yellow Medicine County and most of the following sketch is taken from this history.*

Dr. Dyrnes was born May 5, 1867, on the island of Smolen in Norway. In spite of being a weakling in infancy, he developed normally except for marked nearsightedness. Although he had an intense interest in education, the circumstances at home would not allow any schooling. He lost his father when he was only six years old. His older brother Anton emigrated to America, and, at the age of sixteen, John followed him. He tried his hand at anything to earn enough to allow him to go to school. Not until he had reached young manhood was he able to attend Baldwin Seminary of St. Paul (later Macalester College), and even then only by working as janitor. Later he went to Augsburg Seminary, from which he graduated in 1892. It seems that it was during this period that the thought of becoming a missionary reopened, because, soon after his graduation from Augsburg Seminary, he entered the Theological Department of Augsburg, graduating in 1895. It is said that he commenced his medical studies while going to the School of Theology, but he did not receive his M.D. degree until three years later (in 1898) from the Minneapolis College of Physicians and Surgeons.

Although he had made the decision to become a missionary physician, he practiced in Minnesota waiting for an opening in the mission field. A friend in the Lutheran church was no doubt responsible for his going to Hanley Falls. His stay there was short, as we find him in Morris in December 4, 1898. He remained there until late in 1899, when he received his call for mission service.

His studies in Paris for the necessary degree from the University of Paris, his ordination to the Christian ministry, his arrival at Manasoa, Madagascar, in 1900 are well described in the biographical sketch for Yellow Medicine County. We learn there of his devotion to his chosen field, his illness, the loss of all of his possessions in a fire. In Madagascar, he married Miss Sarah Johnson of Lowry, Minnesota, also a missionary, who ably helped him in his work.

He has been described as a true Nordic type, with light curly hair and blue eyes, and of tall stature. An outstanding feature was his cheerfulness and his contagious humor; it seems he was a true optimist.

He came back to the United States only once for a visit—in 1919 when he came to Minneapolis. Another visit was planned in 1937, but his wife became ill and died. When he had reached retirement age, the mission board did not recall him, seeing that Madagascar had become his real home. Although his health began to fail, he continued with his work until diabetic cataract put an end to his labors in 1943; diabetic gangrene made his last few months very painful, and he died on December 7, 1943. He was buried in Madagascar.

Dr. E. M. Elisey was in Chokio around the turn of the century, coming there as a young man with his wife. They had their first child in Chokio which, however, did not live long. His stay there was of short duration. Nothing more is known about him.** According to unpublished notes on the medical history of

*"Medical History of the County of Yellow Medicine" by Mildred E. Lee, MINNESOTA MEDICINE, 36:1270-1272, 1953.

**Communication from Mrs. Oden L. Henry, March 6, 1956.

Stevens County by Drs. C. E. Caine and F. W. Behuler, he was the fifth physician to locate in Chokio. A *Dr. James R. Elsey* is said to have come to Chokio in 1901 after having practiced for a while in Illinois following his graduation. It seems very likely that these two refer to the same physician.

Dr. James R. Freeman of Washington, D. C., came to Morris in April, 1881, and purchased the M. M. Moan Drug Store, renaming it J. R. Freeman and Co. He practiced in Morris a little over a year, then sold the drugstore and moved to Minneapolis late in August, 1882, where he is listed through 1893 but not after 1896.

Dr. Freeman seemed to have gained a good reputation in Morris in this short time and apparently made many friends. According to an item in the local newspaper of August 31, 1882: "Dr. J. R. Freeman left Tuesday night for Minneapolis where he has permanently located. During the time Dr. Freeman has been in Morris he has gained an enviable reputation as a skillful physician, has made a lot of friends and all regret his departure. While we regret his departure, we wish him success in his new field of labor."

He was a graduate of the National Medical College, Columbian University, Washington, D. C., in 1879. Nothing is known of his background or when and where he died.

Dr. Edward Spurr Frost was frequently called to Stevens County in the 1870's, although he was located in Willmar, Kandiyohi County. His influence was sufficiently felt at all points along the railroad between Willmar and Morris to include him in this history.

Dr. Frost was born in St. John, New Brunswick, in 1843, and was graduated from the University of Pennsylvania in 1866. Then he took postgraduate work in London, Heidelberg and Paris. When the Franco-Prussian war broke out, he joined the Red Cross, but resigned after the battles of Gravelotte and and Mars la Tour. After receiving a postgradute degree in France, he came to the United States. After a short stay in New York he came to Minnesota, settling in Willmar in 1871, as the first physician to locate permanently in Kandiyohi County. He became its outstanding pioneer physician. Dr. Frost died in 1916.

(To be continued in January issue)

Minnesota Blue Shield-Blue Cross

Minnesota Blue Shield recently announced an extension of coverage to include benefits for diagnostic x-rays and diagnostic laboratory services, to become effective on a staggered basis, starting August 1, 1959 and thereafter depending upon the non-group billing date, or, in the case of group subscribers, the next annual renewal date of the group.

To clarify this extension of Blue Shield coverage it should be stated that benefits for such diagnostic services by doctors of medicine will be available when necessary to the diagnosis of or treatment of a sickness or injury. These diagnostic procedures may be carried out in the doctor's office, the patient's home or the out-patient department of a hospital as long as rendered, supervised or directed by a doctor of medicine who customarily bills for his services.

The diagnostic program will not include benefits for x-ray and laboratory services when done in connection with routine physical exams, check-ups, pre-employment or pre-marital exams, etc., but only in those instances where necessary to the diagnosis of or treatment of an illness or injury.

While a Schedule of Payments for the diagnostic services has been forwarded to all participating physicians payment will be provided on the basis of the doctor's customary fee but not in excess of the Schedule.

A maximum of $50 for diagnostic laboratory services and $50 for diagnostic x-ray services under Plan A and $75 for laboratory and $75 for x-rays under Plan B will be available to each participant subscriber for any period of twelve consecutive months.

The extension of the Blue Shield contract to include such benefits has come at the request of many Blue Shield group and non-group subscribers as well as physicians throughout the state. It is the result of the efforts of Minnesota Blue Shield and Minnesota physicians who have developed the program to provide a valuable tool for the prepayment of out-patient diagnostic services.

At the end of 1958 there were 123,038,000 persons nationally participating in voluntary prepayment hospitalization plans reported the Health Insurance Council in its 13th Annual Survey. This represented a gain of more than 1½ million persons over 1957. Over 55,200,000 persons were enrolled in Blue Cross compared to 78,900,000 enrolled through various insurance companies and 4,800,000 through independent plans. Approximately 15,900,000 persons have duplicate coverage.

Hospitalization benefits paid by prepayment plans totaled $2,589,000,000 during the year. Hospitalization expense incurred by Blue Cross members totaled $1,303,000,000 averaging approximately $24 per person covered per year. The $1,186,000,000 hospital expense incurred by insurance companies' subscribers represents an average annual value of approximately $15 per person covered and the $100,000,000 expense incurred by subscribers of independent plans represents an annual benefit value of approximately $20 per person covered.

In Minnesota, Blue Cross hospitalization expense incurred during the first seven months of 1959 totaled $22,369,057 representing an average annual value of Blue Cross benefits per person covered of $33.70.

Accidental injuries caused the hospitalization of 22,599 Minnesota Blue Cross members during the period; benefits incurred exceeded $1,400,000. Obstetrical care was the second leading reason for Blue Cross hospitalization with 19,685 subscribers hospitalized incurring benefits approximating $3,100,000. Respiratory diseases ranked third in causes of Blue Cross hospitalization expense incurred, 18,802 subscribers hospitalized . . . benefits exceeding $2,200,000. Digestive diseases ranked fourth in leading reasons for hospitalization, 16,975 hospitalized subscribers and benefits exceeding $3,700,000.

Communications

THE MACABRE DEATH DANCE AND THE LONG, LONG SLEEP

The lightning-like speed and the world wide race in harnessing the Herculean power of the atom, awes the imagination and sobers one's thinking concerning what the new Atomic Era has created and to where it will lead us. No sooner had this power been introduced to the world when a multitude of startling and perplexing problems challenged the technological, metallurgical and thermodynamic scientist, in coping with what the atom brought into the world. When Watt invented the steam-engine in 1764, there was no metal nor temperature problem to solve. The ferrous material that was used was adequate for the moderate steam pressure and temperature of that time. It was not until World War I that definite practical problems began to arise—due to inadequacy of the material used—in regard to withstanding this high temperature. The Civil War gave birth to the armored battleships. For several decades, the contest between the manufacturers of armor and of the armor piercing shells of the battleships was a challenging game on the Aberdeen proving grounds in Maryland. This could be illustrated by numberless examples, to reveal the technological and metallurgical problems that were created at the turn of the century.

The Manhattan Project, climaxing the detonation of the first atomic bomb July 16, 1945, at Los Alamos, New Mexico, ushered into the world the most startling and sobering scientific event of all time. The press, asking for a statement, got the following replete and succinct statement from the philosopher scientists, "Peace or Perish"! Daily, the admonition is revealing this statement of fact to the world.

World War II was no sooner ended, hastened by a couple of atomic bombs dropped on Japan, when a new and different "Cimarron" race was on—this time, to corral atomic power. The United States was the only nation on earth that possessed the "know how" of the atomic bomb. But, before the decade had passed, this secret became general knowledge. Immediately, the pace of the race for testing atomic war material, accelerated accordingly. But, after a decade of testing, the scientists revealed that the world racetrack was becoming so cluttered with long-lived, radioactive fallout, that the nations began to realize and to appreciate more fully, what the philosopher scientists already knew at the first detonation of the bomb in 1945. In the decade of 1945-1955, accumulating, long-lived, radioactive fallout was generated at a tremendous rate—a pace too rapid for the safety of all living matter. While scientific facts were accumulating, the radioactive fallout was blanketing the earth. Possibly, some of the world leaders saw a striking similarity in the long-range destruction of the fallout, to the mythological cloak of Nessus, the burning garment which the jealous Dejanira gave to her husband, Hercules. The burning cloak of Nessus is with us, in the form of radioactive fallout material to which all of us are, to a certain degree being exposed, over and above that with which nature bombarded us before the atomic era. About four years ago, a physicist friend, working for General Mills, told the following story concerning a box of ruined films. The film company could not explain what had happened. The physicist quickly proved that the films had been ruined by radioactive straw in which the films had been packed. The straw was traced to the Kansas wheat fields of 1946, a year after the first bomb was detonated in New Mexico.

The September report, the latest, on milk radioactivity figures, shows that milk from the St. Louis, Missouri, and Fargo, North Dakota, areas reveal more contamination than that from any other place in the country. The amount present was below the "permissible" safe limit or level set by the national committee on radiation protection. The reports on radioactive fallout are a daily story as found in our various foods. This contamination is presumed to be caused by nuclear weapon tests in the United States and abroad. Various reports like this remind us of the familiar Julia Carney verse from "Little Things." "Little drops of water, little grains of sand, make the mighty ocean, and the pleasant land." It makes us wonder what this atomic bombardment will do over a long period of time, to all living matter in the mighty ocean and the pleasant land.

Scientists are fully aware of the colossal task the atomic era has created. To neutralize the long-lived, radioactive material continues to be the supreme challenge. So far, clean atomic bombs have not been perfected. Baking radioactive waste material in montmorillonite clay is being tried, and it has been found that this impregnated baked clay will retain the radioactive material which is not liberated in turn by the acid, alkali or water of the soil in which the clay is buried. So far as we know, this method is not being used for disposing of waste material. One would suspect that the baked clay could not withstand the terrific bombardment for any length of time, and that it finally crumbles.

The steel, lead and concrete tanks are still used for burial of the highly concentrated radioactive waste material. These tanks hold 4000 or more gallons of this waste material. This solution is so highly concentrated when buried, *that a single drop would require a billion gallons* of water to dilute it down to safety for animal and plant-life consumption. This solution remains radioactive for over six centuries before it becomes reasonably inert. The scientists also maintain that these tanks will disintegrate within a hundred years because of the severe bombardment of the radioactive solution sealed up inside. The liberated solution will then seep into the ground and water, to perform its macabre death dance, for another five hundred years plus. The scientists maintain that the oceans are not big enough to dilute this radioactive waste material to such a degree that it will not destroy ocean life. This also holds, the scientists maintain, for the good earth.

Dr. Hatch, of the Rookhaven laboratory, and Dr. Rodger, of the Argonne laboratory, estimate that by the year 2000, approximately one billion curies of waste material will have been generated in the nuclear reactor plants, this making the disposal of waste material a most serious problem for future safety of all living matter. A nuclear reactor plant for furnishing electricity for a 50,000 population city, requires an output of approximately 20 million watts. In one year it will create approximately 14 million curies of waste material, after the waste material has decayed for a hundred days. In the meantime, more nuclear plants are under construction, while nuclear tests are also being made.

This Section is for you to voice your convictions, comments, and queries on all subjects political, economic, historic, humorous, scientific or otherwise, to many physicians. Writings not sufficiently formal and too brief for an editorial or a scientific manuscript are requested. Clinical and research observations, no matter how brief, similar to those in *The Lancet* (London), are particularly encouraged.

It would seem reasonable to predict that our country is possibly contaminated with more fallout and nuclear reactor waste material than any other world nation. How near are we to the precipice? What is known is that this radiation bombardment performs in a stealthy, silent, painless, lethal manner. And this is also known—that when the sky, earth and ocean glow with radioactivity, it will be too late to turn off the symphonic music the atom plays.

If a promising drug or vaccine is discovered, the United States Public Health Department steps in to protect the public, until all tests have proven safe and satisfactory. The medical profession is then permitted to administer the medicine. The same, I believe, is axiomatic for atomic tests, because of the health hazards they create for the immediate workers and for the population at large. A worldwide problem for the scientists, health authorities, the IGY and world leader to work out!!

A dozen or more megaton or larger hydrogen bombs, striking as many heavily populated and strategic cities, of any world power within a few hours, would cause a holocaust beyond description. Should the war continue for a short time, the destruction of the country would be complete. This would be followed by such a terrific amount of radioactive fallout that no conqueror would even consider entering the country. Not even living bacteria would remain to decay the dead.

World leaders, irrespective of their government philosophies, are becoming fully aware of what the "equilibrium of horror" of atomic war material can do to the world, if unleashed! It requires no prophetic wisdom to predict that the then following war would be fought with sticks, stones and clubs.

The atomic era is here! A fitting project for the IGY organization would be the establishment of a *world holiday* for commemorating the birth of the atomic era, its beautiful potentialities, and especially for the banishment of future world wars. The succinct and replete admonition the philosopher scientists gave the world after the first atomic bomb was detonated in 1945, "Peace or Perish," should be the motto.

If all the stops were to be pulled out in an atomic world war, the world theatre would finally be emptied of listeners while the atomic symphony was performing its macabre death dance. The final strains of the symphony would be a softly played lullaby to the long, long sleep of all living things!

Let us harken to the scientists! They have spoken. "Peace or Perish!"

"Why build these cities great!
If man unbuilded goes?
In vain we build the world
Unless the builder also grows."
—*Edwin Markham*

J. J. Heimark, M.A., M.D.

Fairmont, Minnesota
July 14, 1959

MEDICINE IN RUSSIA

"In the USSR improvement in doctors' professional skill is a matter of national importance," said Prof. Z. I. Yanushkevichius, director of the Kaunas Medical Institute, Kaunas, Russia, in an address before the Second World Conference on Medical Education in Chicago in September. "The state budget bears the whole expense connected with the maintenance of the advanced training institutes for doctors, medical institutes and local facilities. The same goes for traveling allowances, et cetera. A doctor need not worry about who will replace him while he is absent. The state takes care of that."

Prof. Yanushkevichius was one of more than 125 speakers from fifty-one foreign countries appearing on the medical education program at the Palmer House. The conference, sponsored by the World Medical Association, is a medium for the free exchange of scientific information and experiences between countries.

The conference has brought together nearly 1,500 medical educators, representing many races, religions, languages, cultures and countries, but all dedicated to the exchange of ideas for the benefit of mankind.

Prof. Yanushkevichius was loud in his praise of the Russian system of medical care and the training of physicians.

"In the USSR," he said, "a doctor is a state employe entrusted with an honorable task of protecting public health. Therefore, the postgraduate training of doctors is organized and conducted by the government in accordance with needs of the population."

The professor claimed that "the first advanced training institute for doctors in the world was organized by E. Eichvald in Petersburg (Russia) in 1855."

"Here," he added, "the first curricula and methods for various series of lectures and courses were elaborated. Thus a new independent system of specialization and advanced training for doctors was established in Russia."

Prof. Yanushkevichius told the medical educators from all over the world that "the specialization of (Russian) doctors in the main is carried out in the united municipal, regional and republican medical institutions." He added, too, that young doctors going into specialization are taught the fundamentals of the Marxism-Leninism concepts of socialism.

"In the big amalgamation of municipal in- and outpatient clinics, in dispensaries and in various other hospitals the young doctors are going through the courses of specialization on a mass scale guided by experienced specialists. For this purpose a three-year scheme of specialization is arranged in which are included a series of special theoretical and practical disciplines as well as subjects of general education, such as foreign languages and fundamentals of Marxism and Leninism," he said.

The speaker stated that at the present time in the USSR there are eleven advanced training institutes for doctors in which 1,562 professors and teachers are employed.

"During the last forty years," he said, "390,000 doctors have gone through a course of training at these institutes. Annually, more than 27,000 doctors go through a course of postgraduate training, almost one out of ten."

AUSTRIA SAYS "THANK YOU" TO UNKNOWN AMERICAN TAXPAYERS

Most of us pay taxes but few of us get cited in a book dedication. All the more reason to appreciate this thoughtful gesture from Austria!

The Austrian Government has turned out a book entitled, "Ten Years of European Recovery Program in Austria, 1948-1958," and dedicated the 368-page volume "to the unknown American taxpayers to whose tax contributions the Austrian economy owes the millions contributed in good will toward its reconstruction."

In a foreword, Austrian Chancellor Julius Raab adds, "We should be mindful of the fact that the means for our reconstruction were contributed by the American taxpayer. . . . To him, America's man in the street, Austria owes its thanks."

AMERICAN ASSOCIATION OF MEDICAL ASSISTANTS

More and more doctors throughout the country are coming to know what the American Association of Medical Assistants is doing to assist with the education of their members, and more and more interest is being shown by the medical societies, both county and state.

A central office with an executive secretary has been opened in Chicago and members are offered a salary replacement insurance plan comparable to plans offered to the medical profession.

Plans are under way for educational courses which

will be offered to those presently working in the field and to those interested in entering the field as medical assistants. The work in the doctor's office is highly specialized and trained medical assistants are necessary to assist the doctor and to relieve him of many of the details which are a part of the office routine.

The third annual meeting of the Association will be held in Philadelphia, October 16-18 at the Benjamin Franklin Hotel. Medical assistants and physicians are invited to attend.

Here is what a representative group of doctors have to say:

Dr. John W. Rice, Jackson, Michigan: "We in the Michigan State Medical Society are justly proud of the Michigan State Medical Assistants Society. This organization has come from a start in 1949 to an enthusiastic, ambitious, hard-working group of 1000 members at the present time.

"The State Medical Society in Michigan stands squarely behind the medical assistants and we want them to produce a standard for girls working in our offices that is so high that it will become a career program for high school graduates to shoot at.

"We hear seven reports at the opening of our annual meeting of the House of Delegates. One of these is from the President of the Michigan State Medical Assistants Society, along with the President and President-Elect of the Michigan State Medical Society and the President of the State Women's Auxiliary.

"Every County Medical Society has an Advisory Committee in counties where the girls are organized. These committees back the girls and help them with their problems. This year at our annual state meeting we are having our first state-wide meeting of county advisors. This is an effort to coordinate the thinking of the many advisory committees along with the officers of the Michigan State Medical Assistants Society.

"We in Michigan have come a long way from 1949, when the medical assistants were only an idea, to the present shoulder-to-shoulder attitude in support of medical progress in Michigan."

Dr. Fred Sternagel, West Des Moines, Iowa: "I have watched with a great deal of satisfaction the founding, growth and development of the American Association of Medical Assistants. From a small beginning a few years ago, the AAMA has won recognition from the American Medical Association and the State Medical Societies of twenty-one states where they have chapters.

"I have watched carefully the progress of this Association and observed that the highest standards of ethics have governed its activities. Some few physicians who disapprove of the movement on the basis that it tends to create a union and may result in unreasonable demands by assistants upon their employers have found nothing to substantiate their fears.

"One of the principal purposes of the Association is to encourage girls engaged in this activity to become better educated, better trained, better qualified and more capable employes in their chosen vocation. The success of this program should eventually and inevitably lead to financial advancement and adequate compensation for work performed. However, it should be remembered that if members receive more benefits from their career it will not be because of any so-called union, but rather to the higher standards of performance as a result of better training and more requirements for those who seek employment in this field.

"Physicians should welcome increased standards of work requirements and give encouragement to the AAMA because better trained assistants free the physician for other and more important duties. The time lost by a physician interviewing applicants and training girls to assist him in his office is something which may eventually be eliminated entirely through the AAMA and adoption of rules and regulations governing preparation and training of girls for work. These many advantages for the physician, together with the dignity which comes to a doctor's office through the employment of a well-trained assistant who has met prescribed work requirements and who is a member of an accredited and recognized professional association should enlist the support of every physician in the work of the AAMA."

Dr. Robert L. Schaeffer, Allentown, Pennsylvania: "The practice of medicine in recent years has become very complicated, and the work of the medical assistant employed in the physician's office has consequently become complex. There are many facets in medical practice and in the work of the doctor's assistant so that an efficient girl must be trained along many channels. In addition to the particular technical knowledge her doctor requires, she must know the principles of public relations, professional relations, insurance such as Blue-Cross, Blue-Shield, and the various commercial coverages, and she should understand taxes, federal, state and local.

"The American Medical Association and some State and County Societies are aware of the need and have aided the medical assistants to form the American Association of Medical Assistants, with many component state and local groups. The Association's major aim and purpose is to offer educational programs to better equip the assistant for her work in the physician's office. Attendance at association meetings and convention seminars and sharing ideas and special skills with girls of similar interests enriches the knowledge and capabilities of the doctors' assistants so that they will render superior service to the medical profession.

"The American Association of Medical Assistants is an infant who needs the support and *'The Assistant'* of every physician in the AMA. With a strong organization, its program of education will go into high gear and ultimately it will be the doctors who will reap the greatest benefits—well-trained, efficient help for his office will be more readily available.

"DOCTOR—help the American Association of Medical Assistants—help your assistant—to better serve YOU! Urge her to become a member of this dedicated organization.'"

HALLIE CUMMINS, R.R.L.
Chairman, Public Relations Committee
American Association of Medical Assistants

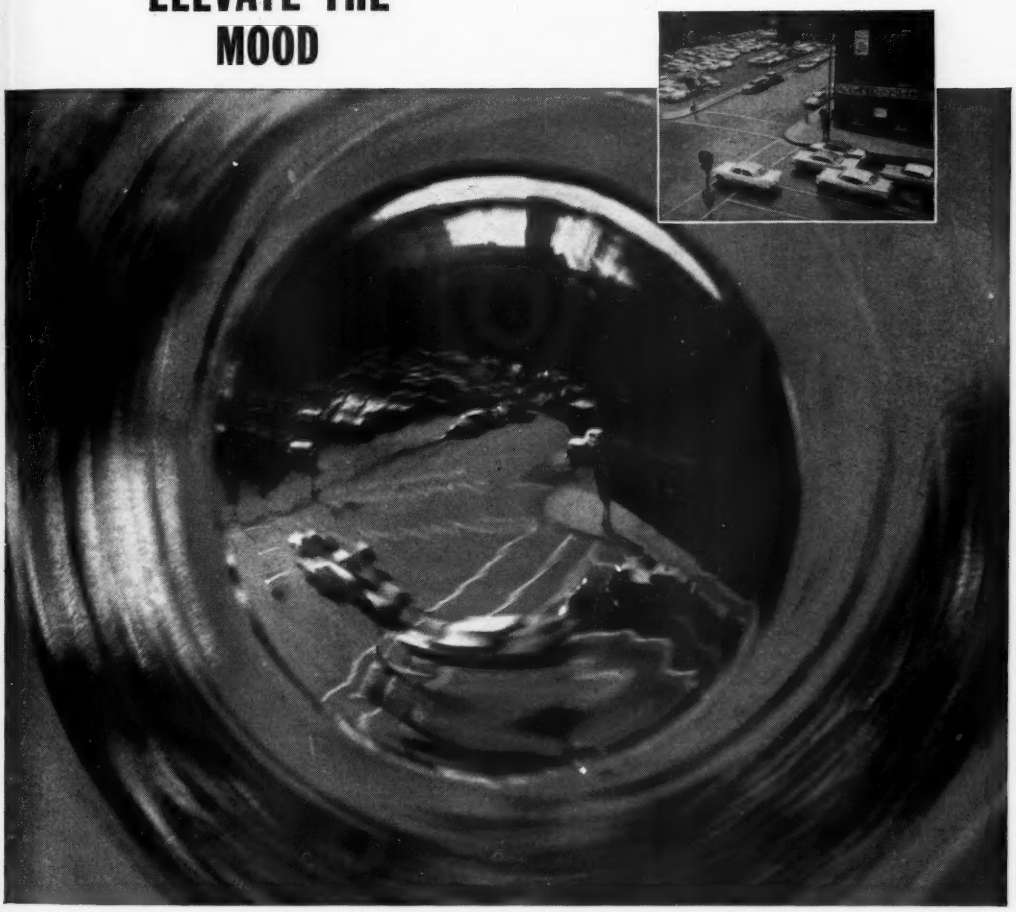
Chicago, Illinois
June 17, 1959

The Venereal Disease Branch, Communicable Disease Center, 50 Seventh Street, N.E., Atlanta 23, Georgia, has established and will maintain a mailing key for the distribution of information copies of new VD educational materials as they become available.

Approximately three times a year, collections of world-wide VD literature for professional persons are abstracted and published under the title: "Abstracts of Current Literature on Venereal Disease." This is distributed by a separate mailing key.

Persons desiring to be included on either or both of these mailing keys should write to Dr. William J. Brown at the above address, requesting that they be placed on the Educational Distribution List and/or receive "Abstracts of Current Literature on Venereal Disease" routinely.

CONTROL VERTIGO, DIZZINESS... AND ELEVATE THE MOOD



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brand of dimenhydrinate with dextro-amphetamine sulfate

"Disturbances of balance resulting from vestibular disorders have long been known to lead to severe anxiety."*

Vertigo—whether of organic or functional origin—tends to leave depression in its wake. Dramamine-*D* is a therapeutic combination designed for treatment of the entire vertigo-reaction syndrome. Each tablet contains dimenhydrinate (50 mg.) to control dizziness, and dextro-amphetamine sulfate (5 mg.) to elevate the mood.

*Pratt, R. T. C., and McKenzie, W.: Anxiety States Following Vestibular Disorders, Lancet 2:347 (Aug. 16) 1958.

Dramamine® available as tablets, ampuls, liquid, suppositories

Research in the Service of Medicine **SEARLE**

Meetings and Announcements

INTERNATIONAL

Eighth Bahamas Medical Conference, British Colonial Hotel, Nassau, Bahamas, November 27 until December 17, 1959.

Second Bahamas Surgical Conference, British Colonial Hotel, Nassau, Bahamas, December 28, 1959 until January 16, 1960.

International College of Surgeons, Twelfth Biennial International Congress, Rome, Italy, May 15-18, 1960.

Fourth International Goiter Conference, July 5-9, 1960, London, England, under the auspices of the London Thyroid Club and the American Goiter Association. Application blanks are available from John C. McClintock, M.D., 149½ Washington Avenue, Albany 10, New York, U.S.A.

Pan American Medical Association Congress, Mexico City, Mexico, May 2-11, 1960. For further information, write Dr. Joseph J. Eller, Director General, 745 Fifth Avenue, New York, New York.

International Congress of Gastroenterology, sixth meeting, Leyden, Netherlands, April 20-24, 1960. Patron: His Royal Highness the Prince of the Netherlands.

United States Section, International College of Surgeons, two-week post-graduate course in General Surgery, in co-operation with the Cook County Graduate School of Medicine. Course begins November 2. Applications should be addressed to Mr. John W. Neal, Registrar, Cook County Graduate School of Medicine, 707 South Wood Street, Chicago 12, or to Doctor Ross T. McIntire, Executive Director, International College of Surgeons, 1516 Lake Shore Drive, Chicago 10, Illinois.

Third International Congress of Physical Medicine, Washington, D. C., August 21-26, 1960.

Second International Symposium on Changing Concepts in Medicine (Congenital Heart Disease), Bellevue-Stratford Hotel, Philadelphia, Pennsylvania, April 28, 29, 30, 1960. For further information write Doctor Charles P. Bailey, The Deborah Hospital, Browns Mills, New Jersey, or Doctor Charles P. Bailey, Deborah National Office, 901 Walnut Street, Philadelphia 7, Pennsylvania.

NATIONAL

Association of American Medical Colleges, annual meeting, Edgewater Beach Hotel, Chicago, Illinois, November 2-4, 1959. For further information, write Ward Darley, M.D., Executive Director, 2530 Ridge Avenue, Evanston, Illinois.

Interstate Postgraduate Medical Association, Forty-fourth Scientific Assembly, Palmer House, Chicago, Illinois, November 2-5, 1959.

Omaha Mid-West Clinical Society, Twenty-Seventh Annual Assembly, Civic Auditorium, Omaha, Nebraska, November 2-5, 1959.

Association of Military Surgeons of the United States, Sixty-Sixth Annual Convention, The Mayflower Hotel, Washington, D. C., November 9-11, 1959.

Medical Aspects on Sports, First National Conference, Dallas, Texas, November 30, 1959, sponsored by the American Medical Association.

American College of Physicians, Postgraduate Course Number Four, Tulane University School of Medicine, New Orleans, Louisiana, November 30-December 4, 1959. For further information write Mr. E. R. Loveland, Executive Secretary, The American College of Physicians, 4200 Pine Street, Philadelphia 4, Pennsylvania.

American Medical Association Clinical Session, Dallas, Texas, December 1-4, 1959.

The Biophysical Society, Fourth Annual Meeting, Sheraton Hotel, Philadelphia, Pennsylvania, February 24-26, 1960. For further information write to H. P. Schwan, Chairman, Local Arrangements, University of Pennsylvania, Philadelphia 4, Pennsylvania, or to O. H. Schmitt, Chairman, Program Committee, University of Minnesota, Minneapolis 14, Minnesota.

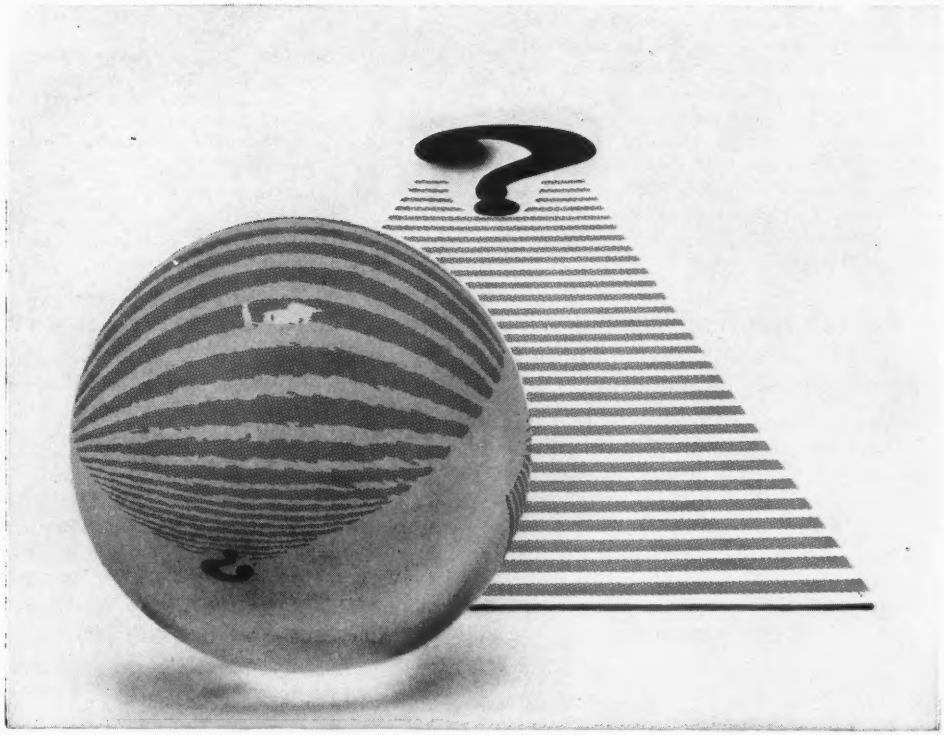
American College of Allergists Graduate Instructional Course and Annual Congress, The Americana Hotel, Bal Harbour, Miami Beach, Florida, February 28-March 4, 1960. For further information, write John D. Gillaspie, M.D., Treasurer, 2049 Broadway, Boulder, Colorado.

National Society for Crippled Children and Adults, Annual Convention, November 29-December 2, 1959, Palmer House, Chicago. For further information, write Miss Catharine Bauer, Director of Information, 2023 West Ogden Avenue, Chicago 12, Illinois.

Twelfth Annual Meeting of the American Association of Blood Banks, Edgewater Beach Hotel, Chicago, Illinois, November 4-7, 1959. For further information write, Office of the Secretary, American Association of Blood Banks, 30 North Michigan Avenue, Chicago 2, Illinois.

Twelfth Annual Conference on Electrical Techniques in Medicine and Biology, Sheraton Hotel, Philadelphia, Pennsylvania, November 10-12, 1959. For further information, write Dr. Herman P. Schwan, Moore School of Electrical Engineering, University of Pennsylvania, Philadelphia, Pennsylvania.

(Continued on Page 1480)



what lurks beyond the broad spectrum?

"Broad spectrum" has evolved into an especially apt term to describe a growing number of "specialized" antibiotics. These provide the best means of destroying pathogenic bacteria which range all the way from large protozoa through gram-negative and gram-positive bacteria to certain viruses at the far end of the spectrum.

But beyond the spectrum lurk pathogenic fungi. Aggressive infections often require intensive broad spectrum antibiotic attack. It becomes more apparent every day that fungal superinfections may occur during or following a course of such therapy.[1,2] Long term debilitating disease, diabetes, pregnancy, corticosteroid therapy, and other causes may predispose to such fungal infections[1,3,4] as iatrogenic moniliasis. These facts complicate the administration of antibiotics.

Mysteclin-V controls both – infection and superinfection. Mysteclin-V makes a telling assault on bacterial infections and, in addition, prevents the potentially dangerous monilial overgrowth.[2,5-8] Mysteclin-V is a combination of the phosphate complex of tetracycline – for reliable control of most infections encountered in daily practice – and Mycostatin, the first safe antifungal antibiotic.

Case history after case history marked "recovered" provides clinical evidence of the special merit of this advance in specially designed antibiotics. When you prescribe Mysteclin-V, you provide "broad therapy" with extra protection that extends beyond the spectrum of ordinary antibiotics.

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Supplied:	Tetracycline Phosphate Complex equiv. Tetracycline HCl (mg.)	Mycostatin units
Mysteclin-V Capsules (per capsule)	250	250,000
Mysteclin-V Half-Strength Capsules (per capsule)	125	125,000
Mysteclin-V Suspension (per 5 cc.)	125	125,000
Mysteclin-V Pediatric Drops (per cc. – 20 drops)	100	100,000

References: 1. Dowling, H. F.: Postgrad. Med. 23:594 (June) 1958. 2. Gimble, A. I.; Shea, J. G., and Katz, S.: Antibiotics Annual 1955-1956. New York, Medical Encyclopedia Inc., 1956, p. 676. 3. Long, P. H., in Kneeland, Y., Jr., and Wortis, S. B.: Bull. New York Acad. Med. 33:552 (Aug.) 1957. 4. Rein, C. R.; Lewis, L. A., and Dick, L. A.: Antibiotic Med. & Clin. Ther. 4:771 (Dec.) 1957. 5. Stone, M. L., and Mersheimer, W. L.: Antibiotics Annual 1955-1956. New York, Medical Encyclopedia Inc., 1956, p. 862. 6. Campbell, E. A.; Prigot, A., and Dorsey, G. M.: Antibiotic Med. & Clin. Ther. 4:817 (Dec.) 1957. 7. Chamberlain, C.; Burros, H. M., and Borromeo, V.: Antibiotic Med. & Clin. Ther. 5:531 (Aug.) 1958. 8. From, P., and Alli, J. H.: Antibiotic Med. & Clin. Ther. 5:639 (Nov.) 1958.

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(Continued from Page 1478)

STATE

Following are the medical continuation courses to be presented at the Center for Continuation Study, University of Minnesota. October 22-24, 1959, Dermatology for General Physicians; November 2-6, 1959, Gastrointestinal Radiology for Radiologists; November 16-18, 1959, Fractures for General Physicians; November 19-21, 1959, Physical Medicine for Specialists; January 11-13, 1960, Ophthalmology for Specialists; and January 21-23, 1960, Surgery for Surgeons. For further information write, Director, Department of Continuation Medical Education, 1342 Mayo Memorial, University of Minnesota, Minneapolis 14, Minnesota.

CLINICS FOR CRIPPLED CHILDREN

The Crippled Children Services Clinics scheduled for October and November 1959 are as follows:

Virginia	Oct. 6-7	Armory	East Range of St. Louis
Bemidji	Oct. 7-8	J. W. Smith School	No. Cass, Beltrami, Clearwater, Hubbard, Blackduck area of Itasca County
St. Cloud	Oct. 8	Bethlehem Lutheran Church	East Stearns, Benton, So. Mille Lacs, Sherburne
Fergus Falls	Oct. 8	Armory	Ottertail, Wilkin
Detroit Lakes	Oct. 15		Norman, Clay, Becker, Mahnoman
Winona	Oct. 20	St. Paul's Episcopal Church	Winona, Fillmore, Houston, Olmsted, Wabasha
Duluth	Oct. 28	United Baptist Church	Lake, Cook, South St. Louis
Austin	Nov. 4		Dodge, Mower
Sauk Centre	Nov. 10	City Hall 2nd Floor	West Stearns, South Todd
Mankato	Nov. 17	Bethlehem Lutheran Church	Blue Earth, Martin, Waseca, Faribault, Watonwan
Anoka			Wright, Ramsey, Kanabec, Anoka, Chisago, Washington, Dakota, Hennepin, Isanti

AMERICAN ASSOCIATION ON MENTAL DEFICIENCY PLANS MINNEAPOLIS MEETING

The thirteenth annual meeting of the North Central Region of the American Association on Mental Deficiency will meet October 28, 29, and 30, 1959, at the Curtis Hotel in Minneapolis.

The three-day event will feature sessions on social work, medicine, administration, and psychology. In addition, tours have been planned for members and guests to visit state institutions and local facilities for the mentally retarded in this area.

Members planning to attend are asked to return Curtis Hotel reservation cards at once.

(Continued on Page 1482)



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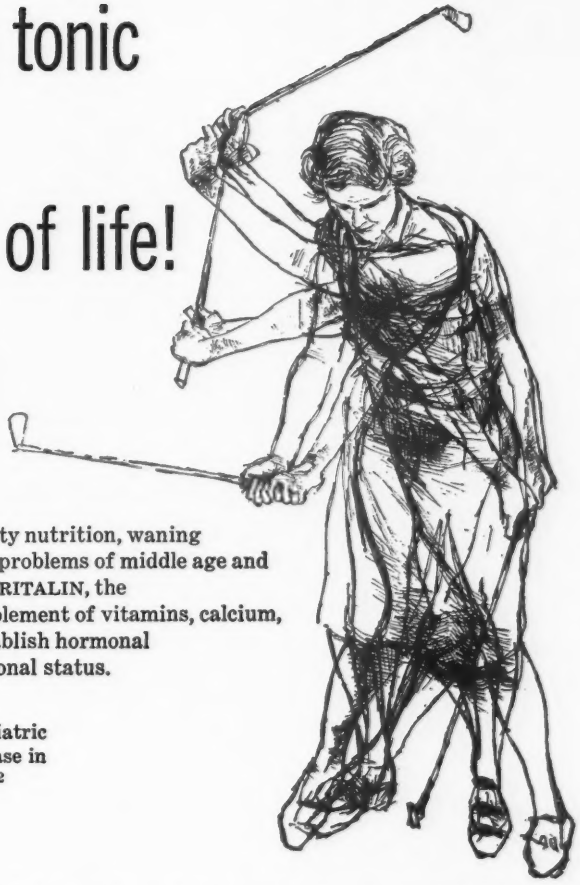
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ethinyl estradiol	5 micrograms
thiamin (vitamin B_1)	5 mg.
riboflavin (vitamin B_2)	1 mg.
pyridoxin (vitamin B_6)	2 mg.
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References: 1. Natenshon, A. L.: J. Am. Geriatrics Soc. *6*:534 (July) 1958.
2. Bachrach, S.: To be published.
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(Continued from Page 1480)

COURSE FOR CARE OF CHRONICALLY ILL PATIENT

A one-week course for physicians, devoted to the rehabilitation care of the chronically ill patient, will be held November 16-20, 1959, under the auspices of the Department of Physical Medicine and Rehabilitation, New York Medical College—Metropolitan Hospital Center. The course will offer a review of the principles and techniques in the medical care of the chronically ill to meet the needs of the clinician, medical administrator and Public Health physician. Course content will ininclude: Physiology and Pathology of Chronic Diseases; Nutrition and Dental Care; Management of Bedridden and Incontinent Patients; Home Care Programming; Community Needs and Resources; Public Health Aspects; Self-Care Activities; Prosthetic Devices and Psychological and Social Aspects.

The tuition fee is $100.00. Traineeships for tuition, maintenance and travel are available through funds provided by the U. S. Office of Vocational Rehabilitation. Applications for the course and traineeships can be obtained directly from Doctor Jerome S. Tobis, Chairman, Department of Physical Medicine and Rehabilitation, New York Medical College, 1 East 105th Street, New York 29, New York.

REHABILITATION WORKSHOP PLANNED

The part played by the social worker in rehabilitating the crippled will be defined and strengthened in an unusual workshop to be held in Chicago in June, 1960.

The workshop will be conducted jointly by the National Society for Crippled Children and Adults and the University of Chicago, School of Social Service Administration, financed by a $13,610 grant by the Federal Office of Vocational Rehabilitation. The Grant will make possible forty all-expense traineeships for social workers presently employed in rehabilitation programs throughout the United States.

NORTHERN MINNESOTA MEDICAL ASSOCIATION

At the annual meeting of the Northern Minnesota Medical Association held in Duluth, September 11 and 12, 1959, the following officers for 1960 were elected: President—Dr. O. K. Behr, Crookston; Vice President—Dr. L. J. Opsahl, Willmar; Secretary-Treasurer (re-elected)—Dr. C. L. Oppegaard, Crookston.

MEDICAL ALUMNI DINNER PLANNED

The University of Minnesota Medical Alumni Association will hold its Annual Dinner Meeting and Dance at the Hotel Radisson Ballroom on Friday, October 30.

A social hour starting at 6:30 p.m. will precede the dinner. Wes Barlow's orchestra has been engaged to play for the dance.

The meeting highlights the reunion of the Silver Anniversary Class annually. Dr. Wayne H. Hagen and Dr. James A. Blake, co-chairmen on arrangements for the Class of 1934, report that approximately 75 per cent of the class members plan to attend.

Dinner tickets including the social hour and dance at

(Continued on Page 1484)



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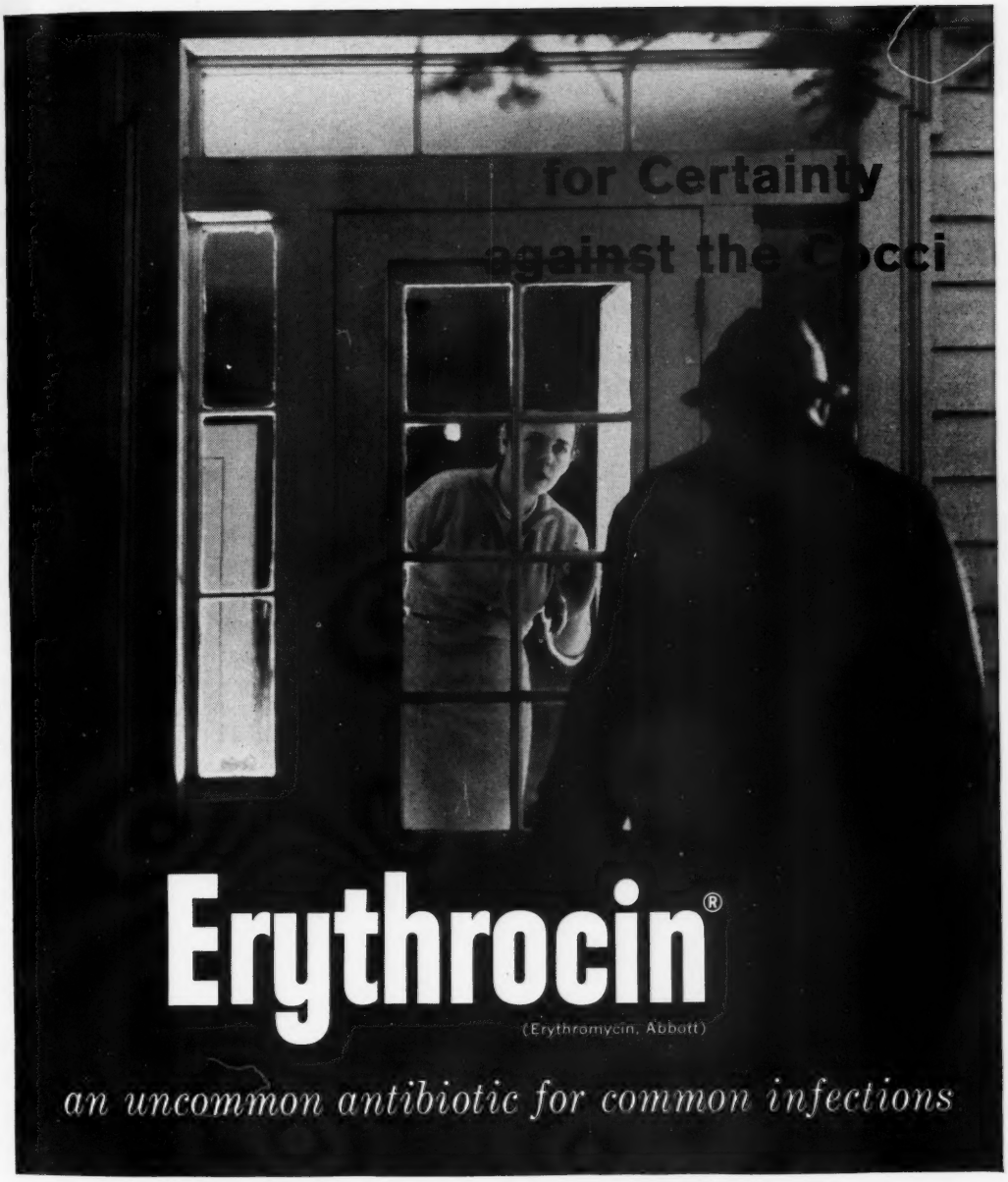
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(Continued from Page 1482)

$7.50 each may be purchased through the Medical Alumni Association office, 205 Coffman Memorial Union.

Dr. Virgil J. P. Lundquist, Minneapolis, is president of the association.

NEW YORK UNIVERSITY-BELLEVUE MEDICAL CENTER POSTGRADUATE COURSES

The following courses have been announced by the New York University Bellevue Medical Center Postgraduate Medical School:

Review of Surgery of the Stomach, Duodenum and Small Intestine—October 26 through 30, 1959.

Review of Surgery of the Biliary Tract and Pancreas.—November 2 through 6, 1959.

Arthritis and Related Disorders—November 9 through 13, 1959, and May 16 through 20, 1960.

Review of Surgery of the Colon and Rectum—November 9 through 13, 1959.

Review of Surgery of the Head and Neck, Including the Thyroid—November 16 through 20, 1959.

Ophthalmic Plastic Surgery—For Specialists—November 16 through 20, 1959.

Review of Abdominal Surgical Diseases in Children—November 23 through 25, 1959.

Allergy—November 30 through December 18, 1959.

Surgery of the Cornea—November 30 through December 4, 1959.

For additional information write: Office of the Associate Dean, New York University Postgraduate Medical School, 550 First Avenue, New York 16, New York.

AUTOMOBILE TRAUMA SYMPOSIUM PLANNED

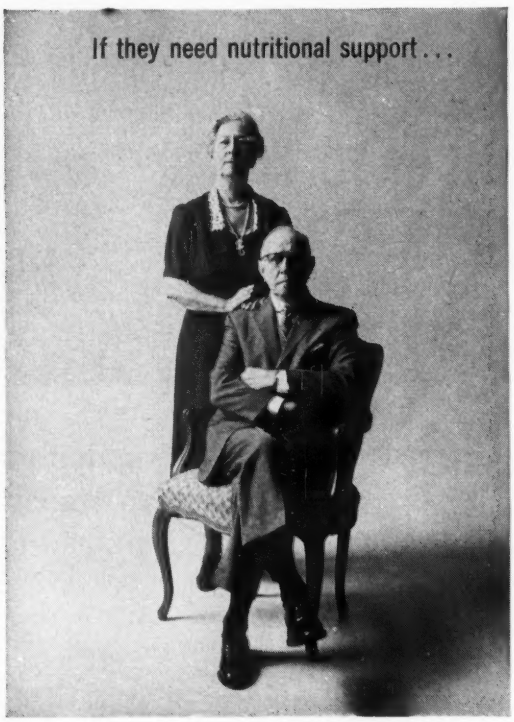
All physicians are invited by the new Methodist Hospital of St. Louis Park (Minneapolis), Minnesota, to attend an all day Symposium at the hospital, Saturday, November 14, 1959, on the subject "Automobile Trauma."

Guest speakers for this symposium include Fiorindo Simeone, Professor of Surgery, Western Reserve University, Cleveland, Ohio; and Dana M. Street, M.D., Chairman of the Department of Orthopedics, University of Arkansas.

Physicians and their wives are invited to attend the dinner at the Radisson Hotel at Minneapolis following this symposium. In the evening the subject "Safety on the Highway" will be discussed. The Hon. Kenneth A. Roberts, of the House of Representatives, will speak on "Safety Legislation."

Seven hours of Category I credit will be given by the Academy of General Practice for attendance at this symposium.

Further information concerning this program may be obtained by writing to Reuben Berman, M.D., Program Chairman, Methodist Hospital, St. Louis Park 26, Minnesota.



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1. Clark, G.M.: Personal Communication, 1958.

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Woman's Auxiliary

AUXILIARY MEMBERS WARNED AGAINST NEW MAGAZINE

The following bulletin was recently received from American Medical Association headquarters:

On advice of the Advisory Committee, the Woman's Auxiliary to the American Medical Association declined to either support or make the membership list available to a new magazine, *The Doctor's Wife*. This is a new popular reading type magazine being published by a group in the East. The first issue was scheduled for September, 1959.

The County auxiliaries are asked to adhere to this policy also if they are approached for endorsement or support or for a list of members.

CORRECT ADDRESSES ARE IMPORTANT

All members are requested to note that it is very important that your county treasurer have your correct address. Please notify your county treasurer when you move.

Proper forms are provided by the Post Office to make this a simple task. It is costly for your State Office to pay both the original postage and the return and handling charges on *Gopher Doctor's Wife* and other Auxiliary correspondence.

County Treasurers please send notifications of changes of address, death and resignation to Miss Ruth Nelson, Minnesota State Medical Association, 496 Lowry Medical Arts Building, St. Paul 2, Minnesota.

Please co-operate in this project in order that files may be kept as up to date and accurate as possible, urges Mrs. Elmer M. Hill, State Treasurer.

RAMSEY COUNTY AAPS CONTEST CHAIRMAN NAMED

Members of the committee in charge of the American Association of Physicians and Surgeons Essay Contest for the coming year include:

Mrs. Wallace Gleason; Mrs. Harold Peterson and Mrs. Earl Wetzel (Parochial).

RAMSEY COUNTY NEWS

Mrs. Hans Schwyzer, President, has met several times with her newly appointed board to outline plans for the coming year.

Committees under Mrs. Phil Roy, Chairman of Ways and Means, were in charge of arrangements for the Ramsey County Auxiliary Style Show and Luncheon given at the St. Paul Hotel on September 14. The proceeds of this activity will be used in the organization's philanthropic work.

Nine members have attended an indoctrination course which has prepared them for work at the Blood Bank. Mrs. Charles Froats and Mrs. E. Russell Sterner are co-chairmen for this project of the Auxiliary for the coming year.

In Memoriam

ELMER W. ARNOLD

Dr. Elmer W. Arnold, a physician in the Adrian community for the past forty-two years, died September 2, 1959. He was seventy-six years old at the time of his death.

In 1958, the city of Adrian announced plans to name the new community hospital in honor of Doctor Arnold. The Doctor Arnold Memorial Hospital was nearing completion at the time of the physician's death.

The deceased was born in Marcus, Iowa, and received his preliminary education at Redfield College Academy, Redfield, South Dakota. His medical education was obtained at the College of Medicine, University of Nebraska.

Doctor Arnold was a member of the Southwestern Minnesota Medical Society, the Minnesota State Medical Association and the American Medical Association.

He is survived by his wife, one son, Rodney, Adrian, and five grandchildren.

T. N. FLEMING

Dr. T. N. Fleming, St. Cloud physician, died August 24, 1959. He was a specialist in Eye-Ear-Nose-Throat He was seventy-nine years old at the time of his death.

Doctor Fleming was born in Sutton, Nebraska, where he obtained his preliminary education. His medical education was received at the University of Nebraska at Lincoln and Creighton Medical School located in Omaha, Nebraska.

He served as superintendent of schools in Lyon, Nebraska and principal of Omaha High School. Following graduation from Creighton Medical School, he practiced medicine at Cold Spring, Minnesota, and Creighton, Nebraska. After completing specializing training in Eye, Ear, Nose and Throat, he moved from Cold Spring to St. Cloud. Doctor Fleming retired from practice in St. Cloud on November 7, 1958.

Doctor Fleming was a member of the Stearns-Benton County Medical Society, the Minnesota State Medical Association and the American Medical Association.

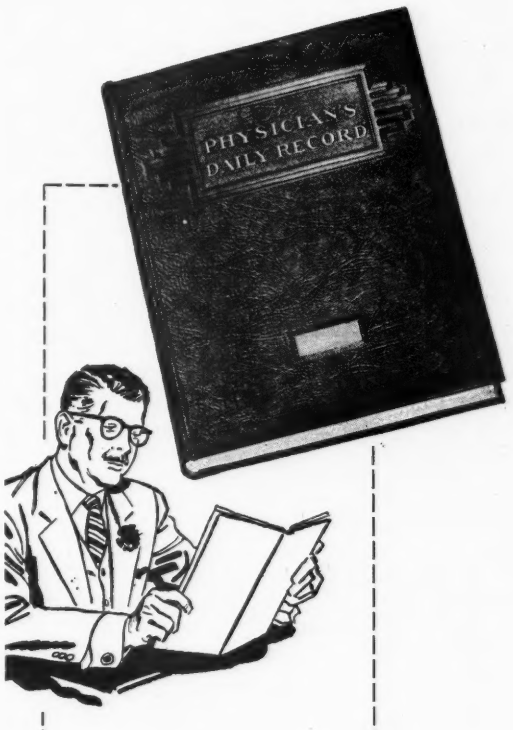
Surviving him are his wife, Rose Mary; seven children, Mrs. Clarence King (Donata), Lansing, Michigan, Thomas, Chicago, Illinois, Doctor Paul, Casper, Wyoming, Doctor Robert, St. Charles, Missouri, Doctor Richard, San Luis Obispo, California, Mrs. George Clark (Rosemary), Kansas City, Missouri, and Joseph, Virginia; and four brothers, Edward, Omaha, Nebraska, John, Sutton, Nebraska, William, Lincoln, Nebraska, and James, Pablo, Montana.

ROBERT L. FAUCETT

Dr. Robert L. Faucett, a member of the staff of the Mayo Clinic since 1953, died August 5, 1959. Death was caused by an accidental electric shock. He was forty-three years old at the time of his death.

Doctor Faucett was born in Independence, Missouri. He attended the University of Kansas Medical School, from which he received the degree of Bachelor of Arts

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in 1938, that of Master of Arts in Bacteriology in 1940 and that of Doctor of Medicine in 1944. In 1944 and 1945 he was an intern, and in 1945 and 1946 he was a resident in pediatrics, in the University of Kansas Hospitals. He entered the Medical Corps of the Army of the United States and then, on December 9, 1946, he was commissioned a senior assistant surgeon in the U. S. Public Health Service and was assigned to the U. S. Public Health Service Hospital at Lexington, Kentucky. On July 1, 1948, he was assigned by the Public Health Service to the Department of Psychiatry in the University of Minnesota for graduate studies in pediatric psychiatry.

Doctor Faucett went to Rochester in July, 1949, as a special worker assigned to the former Rochester Child Health Institute.

Doctor Faucett left Rochester in January, 1951, to become Director of the Prince Georges County Mental Health Clinic at the University of Maryland in College Park, Maryland.

He returned to Rochester on July 1, 1953, as a Consultant in Psychiatry in the Mayo Clinic and was appointed Instructor in Psychiatry in the Mayo Foundation, Graduate School, University of Minnesota, in 1955, and advanced to the grade of Assistant Professor in 1959.

Doctor Faucett was a member of the Zumbro Valley Medical Society, the Minnesota State Medical Association, the American Medical Association, the Minnesota Psychiatric Society, the American Psychosomatic Society, the Society of the Sigma Xi and the Alumni Association of the Mayo Foundation. He was a Fellow of the American Psychiatric Association.

Survivors include his wife and two children, Russell and Julia Ann.

EDGAR T. HERRMANN

Dr. Edgar T. Herrmann, 780 Blue Gentian Road, Egan Township, St. Paul, died August 26, 1959, at Miller Hospital after an illness of four years. He was sixty-six years old at the time of his death.

A native of St. Paul, Doctor Herrmann was a specialist in Internal Medicine. He had practiced in St. Paul for more than thirty-five years.

Doctor Herrmann was a member of the Minnesota Club, American College of Physicians, Ramsey County Medical Society, the Minnesota State Medical Association and the American Medical Association.

He graduated from the University of Minnesota Medical School in 1919. He later became an Assistant Professor of Medicine at the University of Minnesota Medical School.

Doctor Herrmann is survived by his wife, Elizabeth C.; a daughter, Mrs. Elizabeth H. Cowie; a sister, Miss Eleanor Herrmann, and three grandchildren, all of St. Paul.

MATTHIAS LENT RANSOM

Doctor Matthias Lent Ransom, physician and surgeon and a resident of Hancock, Minnesota, for fifty-six years, died August 27, 1959. He was eighty-six years old at the time of his death.

Military services were conducted for Doctor Ransom by the American Legion Post of Hancock of which he was a charter member.



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Calcium (as $CaHPO_4$)	157 mg.
Phosphorus (as $CaHPO_4$)	122 mg.
Boron (as $Na_2B_4O_7.10H_2O$)	0.1 mg.
Copper (as CuO)	1 mg.
Fluorine (as CaF_2)	0.1 mg.
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Doctor Ransom came to Hancock in 1903. Throughout his lifetime he was active in social and civic activities in the Hancock community. He served on the Council, was Health Officer and was the first Commander of the Hancock American Legion.

The deceased was a member of Stevens County Hospital Staff, a member of West Central Medical Society and served as its president, a Life member of the Minnesota State Medical Association and the American Medical Association.

In addition, Doctor Ransom had served as surgeon for Great Northern Railroad. He was affiliated with the Democratic party and served many years on the county committee.

Doctor Ransom was born at Ulster, Pennsylvania, on October 20, 1873, the son of William and Marian Ransom. He graduated from the Spencer, New York, high school in 1896 and entered Jefferson Medical College that fall.

Upon graduation from medical school in 1902 he began his practice at Foley, Minnesota. In 1903, he opened an office in Hancock where he practiced until his retirement.

Doctor Ransom served as a First Lieutenant in the first World War enlisting on August 1, 1917. He was promoted to Captain and served overseas from August 1, 1918 to May 30, 1919. He was discharged in June of 1919 and returned to Hancock.

Survivors include his sister, Mrs. H. A. L'Amoreaux of Spencer, New York, six nieces and nephews.

GUSTAVE L. RUDELL

Dr. Gustave L. Rudell, a veteran Minneapolis physician, died August 8, 1959. He was eighty-three years old at the time of his death.

Doctor Rudell was born in Sweden. He came to the United States at the age of sixteen and later enrolled at Gustavus Adolphus College in St. Peter, Minnesota. He received his medical education from the University of Minnesota Medical School.

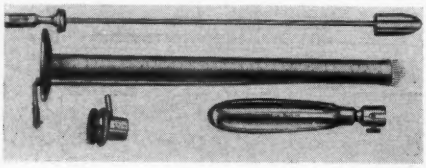
Following graduation, he interned at Bethesda Hospital in St. Paul and practiced medicine at the Plaza, North Dakota Indian Reservation. He did Postgraduate work in Vienna, Austria, and served as Captain in the United States Army Medical Corps in World War I.

Doctor Rudell established his practice in the Camden area of North Minneapolis in 1920. He was interested in promoting and preserving Swedish culture and was a member of the Odin Male Chorus, the Swedish-American Institute, the Swedish Pioneer Historical Society, the Swedish Cultural Society and Svenska Sallskapet.

Doctor Rudell was also a member of the Hennepin County Medical Society, the Minnesota State Medical Association and the American Medical Association. In 1957, he was honored by the Minnesota State Medical Association for fifty years of practice. He was a Thirty-Second Degree Mason and a member of the Zuhrah Temple of the Shrine.

Survivors include two sisters, Amanda Rudell, Lafayette, Minnesota, and Fanny Rudell, Sweden; eight nieces and two nephews.

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O. W. SCHOLPP

Dr. O. W. Scholpp, who practiced medicine in Hutchinson, Minnesota, for fifty years, died August 26, 1959. He was eighty years old at the time of his death.

Doctor Scholpp, who was a radiologist, continued in practice up to the time of his death.

He was born in Bulmann, Alabama, and attended Colgate University. He received his medical degree from the University of Maryland. After practicing medicine for one year at Duluth, Minnesota, he moved to Hutchinson in 1909. He also attended the University of Minnesota Medical School and studied at Johns Hopkins, Massachusetts General and Bellevue Hospitals. He also studied at the University of Vienna and other European medical schools.

Doctor Scholpp was a member of the Radiological Society of America, the American College of Radiology, the Congress of Radiology, the McCloud County Medical Society, the Minnesota State Medical Association and the American Medical Association.

In addition he was a member of the Zuhrah Temple of the Shrine and the Veterans of Foreign Wars.

Survivors include a son, George, Vienna, Virginia; a daughter, Mrs. James M. Fisher, Phoenix, Arizona; and a sister, Mrs. Katherine Volk, Buffalo, New York.

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EDWARD W. SENN

Dr. Edward W. Senn, Owatonna physician, died July 18, 1959. He was seventy-eight years old at the time of his death.

The deceased was born in 1881 in Theresa, Wisconsin. His preliminary education was obtained at Kasson, Minnesota, Public School. His medical education from Hamline University, St. Paul, Minnesota.

Doctor Senn interned at St. Barnabas Hospital in Minneapolis. He did Postgraduate work in Surgery and Eye, Ear, Nose and Throat for one year in Chicago.

He was Past Exalted Ruler of the Elks Lodge, and a long-time member of the Masonic Lodge. He served the latter organization as its Knight Templar, a member of the Osman Shrine Temple.

Doctor Senn was active in many community activities and organizations. He served on the Owatonna School Board for a total of twenty-one years.

The deceased was also a member of the Steele County Medical Society, the Minnesota State Medical Association and the American Medical Association.

Survivors include a son, Mahlon, Owatonna; two grandchildren; and two sisters, Mrs. Alma Gilleland, St. Paul and Mrs. Edward Denneson, Austin.

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527 Medical Arts Bldg., Tel. FE. 2-1357, Minneapolis, Minn.

Superintendent
Ella M. Leseman
Prescott, Wisconsin
Congress 2-5522

The Physician's Diary

A number of Mayo Clinic staff members recently received promotions. They are: Medicine—**Drs. David T. Carr, C. H. Hodgson, R. M. Salassa** and **L. E. Ward** to Associate Professor; **Raymond V. Randall, R. A. Rovelstad** and **H. H. Scudamore** to Assistant Professor; Biophysics—**A. L. Orvis** to Assistant Professor; Dermatology—**Richard K. Winkelmann** to Assistant Professor; Pathology—**R. C. Bahn** and **E. H. Soule** to Assistant Professor; Surgery—**William H. Bickel** to Professor, **Oliver H. Beahrs** to Associate Professor, and **W. H. ReMine, Jr.,** to Assistant Professor; Neurology—**Clark H. Milikan** to Professor, **David Daly** to Associate Professor, **Norman P. Goldstein** and **J. G. Rushton** to Assistant Professor; Ophthalmology—**Robert W. Hollenhorst** to Associate Professor, **Thomas P. Kearns** and **Theodore G. Martens** to Assistant Professor.

* * *

Glencoe physician, **Dr. D. R. Navratil,** recently announced his decision to stay in Glencoe despite an opportunity offered him to join the surgical department of a medical group in Virginia.

* * *

Dr. Victor Johnson, Director of the Mayo Foundation, will serve as deputy president of the Second World Conference on Medical Education. Doctor Johnson also served as chairman of the Program Committee for the conference held recently in Chicago at the Palmer House.

* * *

Chaska physician, **Dr. G. T. Schimelpfenig,** recently left for Europe. While in Europe, Doctor Schimelpfenig participated in the Eleventh Annual International Meeting of the Experiment in International Living in Grenoble, France, August 29 through September 4.

* * *

Dr. John S. Lundy, recently retired from the Board of Commissioners of the Mineral Springs Sanatorium. Replacing him was another Mayo Clinic physician, **Dr. Herbert W. Schmidt.** Doctor Lundy had served on the Board since September 1952.

* * *

The new member of the research team at Mount Sinai Hospital, Minneapolis, is **Dr. Fletcher A. Miller.** He has been appointed Director of Surgical Research and Teaching at the Hospital.

* * *

Dr. Magnus C. Petersen, Rochester, announced plans to retire March 1 as Superintendent of the Rochester State Hospital. Doctor Petersen will enter the private practice of psychiatry in Rochester after seventeen and one-half years as head of the Rochester institution.

* * *

Lake Wilson physician, **Dr. T. T. Harada,** announced recently that he will be leaving Lake Wilson, after eight and one-half years of practice, for Redding, California, where he has accepted a position as a staff surgeon at Shasta County Hospital.

The East Central Medical Association held a meeting in Mora recently at which **Dr. Robert Howard,** Dean of the Minnesota Medical School, was the featured speaker.

* * *

Dr. James J. Anderson, Mankato, recently announced plans to move to Minneapolis. Doctor Anderson has practiced medicine in Mankato for nine years and his departure is not scheduled until next February.

* * *

Among guest speakers listed for the program of the Forty-first National Meeting of the American Institute of Chemical Engineers, September 27-30 is **Dr. Charles W. Mayo,** Rochester. Doctor Mayo's address is titled "Health, An Instrument for Peace."

* * *

Drs. E. E. Zemke and **Robert Schulz,** Fairmont, recently announced the addition of **Dr. Robert W. Gustafson,** Fairfax, to their staff.

* * *

The Olmsted Medical Group recently annonced the resignation of **Dr. John R. Watson.** Doctor Watson has been affiliated with the group since 1955. The resignation takes effect October 1.

* * *

Dr. Hobert J. Setzer, Jr., Minneapolis, recently joined the Internal Medicine staff at the Mankato Clinic.

* * *

A recent appointment to the Mayo Clinic staff is **Dr. Philip J. Osmundson.** Doctor Osmundson is a consultant in medicine.

* * *

Ellendale physician, **Dr. Morton Roan,** recently announced that he is unable to handle the duties of the new medical center in Ellendale because of ill health. It was later announced that Doctor and Mrs. Roan have moved to the Twin Cities.

* * *

Drs. Khalil G. Wakim and **Jesse L. Bollman,** Mayo Clinic, are co-authors of a book "Chemical Quantitation of Epinephrine and Norepinephrine in Plasma," recently published by Charles C Thomas, Springfield, Illinois. Senior author of the book is Doctor William M. Manger, a former fellow in medicine of the Mayo Foundation.

* * *

Dr. David P. Anderson and other members of the Austin Clinic staff had a University of Pennsylvania medical student working with them this summer. The student has been working for a preceptorship. Doctor Anderson has helped five students in this capacity. Doctor Anderson is a gradaute of the University of Pennsylvania.

* * *

The officers of the Forest Lake Memorial Hospital Association have signed an agreement with **Dr. G. M. Ruggles,** of that community, whereby the association will acquire the equipment of Doctor Ruggles' Forest Lake Clinic Hospital when the proposed new Memorial Hos-

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pital opens for business in Forest Lake. Under the terms of the agreement, the full purchase price is $40,000 of which $15,000 is to be deducted as a gift to the new hospital by Doctor Ruggles. The balance of $25,000 will be paid on an installment plan after the new hospital is assured.

* * *

Dr. Wendell M. Swenson, St. Peter, has recently been appointed to the staff of the Mayo Clinic, as a consultant in Clinical Psychology.

* * *

The Olmsted Clinic recently announced that Dr. **John O. Flugel** has been elected a partner in that group.

* * *

The Mankato Clinic recently announced the addition of **Dr. John L. Marso** to their obstetrics and gynecology staff.

* * *

Dr. Juergen E. Thomas, Mayo Clinic, has recently been appointed to the staff of the Mayo Clinic as a consultant in Neurology. Doctor Thomas previously was assistant to the staff in Neurology.

* * *

The community of Frazee, Minnesota, recently honored its only resident physician, **Dr. Henry C. Otto,** for forty-two years of medical practice. Doctor Otto practiced medicine in Vergas before moving to Frazee. Doctor Otto has practiced medicine for over half a century in Minnesota.

* * *

Recently appointed to the Mayo Clinic staff as a consultant in Medicine is **Dr. Richard H. Ferguson.**

* * *

A former physician from St. Paul, **Dr. J. L. Purdie,** has joined **Dr. G. T. Midboe** in the practice of medicine in Forest Lake.

* * *

Dr. James G. Delano, formerly of Philadelphia, has been appointed to the staff of the Mayo Clinic as a Consultant in Psychiatry.

* * *

Recently named as members of the Medical Advisory Committee to the National Foundation in St. Cloud are **Drs. Richard Kline** (Chairman), **James Zelleny, Leo Temp,** and **Charles Donaldson.**

* * *

Dr. John W. Rosevear has recently been appointed to the staff of the Mayo Clinic, as a Consultant in the Section of Biochemistry. Previously Doctor Rosevear was an assistant to the staff in that section.

* * *

Dr. Russell M. Wilder, emeritus consultant in medicine of the Mayo Clinic, and emeritus professor of medicine in the Mayo Foundation, was named an honorary member of the American Dietetic Association at the Forty-Second Annual Meeting of that organization recently in Los Angeles. Prior to 1959, only ten other persons, distinguished in the fields related to nutrition, had been honored in this way by the association.

* * *

Ceylon physician, **Dr. Jack Gardner,** was appointed coroner of Martin County by the Martin County Board

(Continued on Page 1500)



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(Continued from Page 1498)

of Commissioners recently. Doctor Gardner will fill out the unexpired portion of **Dr. M. H. Marken,** who resigned as coroner earlier.

* * *

Recently elected chairman of the Minnesota Flying Physicians is **Dr. Roger Johnson,** Wayzata. Elected co-chairman of the group is **Dr. O. M. Wilbur,** Hibbing. The elections took place at a recent "fly-in" near Grand Rapids. Among speakers on the program was **Dr. C. Kent Olson,** Minneapolis. The group was formed in 1955 to promote a spirit of fellowship within the medical profession for those who have a pilot's interest in aviation.

* * *

Dr. Glenn W. Brown, formerly of Bottineau, North Dakota, recently joined the staff of the Morris Medical Center.

* * *

Drs. J. S. Siegel and **Wayne Johnston,** Virginia physicians, recently announced the addition of **Dr. Wendell P. Enggelstad,** to their practice of medicine.

* * *

Dr. Harry R. Baker, who has practiced medicine for over half a century in Hayfield, Minnesota, was recently honored by that community. Doctor Baker was honored by the Minnesota State Medical Association in 1957 as a member of the "Fifty Club."

* * *

The Litchfield Clinic recently announced the addition of **Dr. Paul Drexler** to its medical staff.

* * *

Dr. Wallace E. Mathews recently joined **Dr. R. B. Engstrom,** Mankato physician, in the practice of medicine in that city.

* * *

The six full-time doctors of the Oxboro Medical Clinic staff recently announced the appointment of **Dr. Henry S. Bloch** to their staff in the capacity as Doctor of Internal Medicine.

* * *

A native of Austin, **Dr. Charles A. Roach,** recently joined the medical staff of the Austin Clinic. Doctor Roach will be serving the Clinic in the capacity of a general practitioner.

Dr. Leslie Zieve and **Dr. Earl Hill** presented a paper on "Two Varieties of Hemolytic Anemia in Portal Cirrhosis" at the annual meeting of the American College of Physicians in Chicago in April. Dr. Hill was inducted as a fellow of the College at this meeting.

* * *

Dr. Robert DeWerd has recently joined the Owatonna Clinic. Doctor DeWerd will work in the field of general practice.

* * *

Recently appointed to the staff of Doctors Memorial Hospital, Minneapolis, are **Dr. Melvin G. Oppen** and **Dr. David W. Feigal,** Wayzata; **Dr. Roger S. Johnson,** Excelsior; and **Dr. E. Harvey O'Phelan,** Minneapolis. All are general practitioners except Doctor O'Phelan who is an orthopedic surgeon.

* * *

The Alexandria Clinic staff has a new member, Dr. **Richard Eddy,** who has joined the clinic in the practice of medicine. Doctor Eddy was recently released from the Army.

* * *

Dr. J. Purdon Martin, emeritus chief of staff in the National Hospital for Neurologic Diseases and Epilepsy, Queen's Square, London, England, gave a lecture on "Extrapyramidal Dyskinesias" at the Mayo Foundation, Rochester, Minnesota, on September 29, 1959.

* * *

Dr. Jack Berry, formerly of the Obstetric and Gynecology Department, Ellsworth Air Force Base, Rapid City, South Dakota, has recently joined the Surgical and Medical Clinic of Albert Lea, Minn.

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Congenital Heart Disease Involving the Aortic Valve

Four Cases Treated by Direct-vision Surgery

REUBEN BERMAN, M.D.
ANATOLIO B. CRUZ, M.D.
NATHAN K. JENSEN, M.D.
WILLIAM HEUPEL, M.D.
JAMES DAHL, M.D.
JOSEPH J. GARAMELLA, M.D.
Minneapolis, Minnesota

Presented in part, Minnesota Society of Internal Medicine, Minneapolis, Minnesota, May, 1959.

From Mount Sinai Hospital and Jay Phillips Laboratory, Minneapolis, Minnesota. Supported by John A. Hartford Foundation, Inc., U.S.P.H.S. Grant No. H-2610, the Free Bed Fund of Mount Sinai Hospital Woman's Auxiliary, and the Cardiac Research Committee of Minneapolis.

FOUR CASES of various types of congenital aortic valve defects have been encountered at Minneapolis Mount Sinai Hospital since 1957. Two had insufficiency, one with ventricular septal defect and one following subacute bacterial endocarditis on a bicuspid valve. Two had stenotic orifices, one valvular and one subvalvular. All were subjected to open heart surgery with excellent results in three, and failure in the case of insufficiency of the bicuspid valve. These cases are reported to illustrate some of the problems encountered in diagnosis, in evaluating the surgical indications, and in management.

Aortic Insufficiency Associated with Ventricular Septal Defect

The combination of ventricular septal defect with aortic insufficiency has been reviewed in several recent publications[1,2,3] reporting about fifty cases. The presenting symptoms are usually those of heart failure.[3] Physical signs include the classical findings of aortic incompetence, high pulse pressure, collapsing pulse, and diastolic murmur; associated with systolic murmur and thrill over the sternum.[4] The murmurs thus appearing throughout systole and in diastole may be confused with a continuous murmur of patent ductus arteriosus. The common features of high pulse pressure with attendant physical findings add to the difficulty in distinguishing patent ductus arteriosus from ventricular septal defect with aortic insufficiency. The pulse pressure, however, is less exaggerated in patent ductus.[5] A thorough discussion of the differential diagnosis is given by Scott *et al.*[1] Gross[5] suggested that the septal defect can contribute to aortic valve malposition by absence of supporting tissue beneath the valve. In the case reported by Nellen *et al*,[3] the ventricular septal defect was found eight years before evidence of aortic insufficiency appeared. These observations suggest that the septal defect is primary and aortic insufficiency the complication, probably post-natal. Previous attempts at surgical correction of these defects have resulted in uniformly poor results.

Case 1.—A thirteen-year-old girl was admitted October 27, 1957, to October 29, 1957. A heart murmur had been known since birth and she was brought in for cardiac evaluation. She had no symptoms except for slight shortness of breath on moderate exertion.

Blood pressure was 140-160/0-20 mm. Hg. The heart appeared slightly enlarged to the left. There was a heaving apical impulse. Grade IV systolic and diastolic murmurs were found over the base of the heart radiating down the left sternal border to the apex. A systolic thrill was apparent at the base. The systolic murmur also could be heard in the neck vessels and in the arms. A normal second sound was present at the base. The re-

mainder of the physical examination was reported as negative. The electrocardiogram showed left strain in a vertical heart. Cardiac fluoroscopy and radiography demonstrated left ventricular enlargement with tremendous pulsation of the ascending aorta. No valvular calcification was noted. There was no radiologic evidence of a left-to-right shunt. Right heart catheterization was normal as follows: Pulmonary artery pressure 20/10 mm. Hg., right ventricle 20/2, right atrium 5/1. Pulmonary artery oxygen saturation was 72 per cent, right ventricle 72 per cent to 71 per cent, right atrium 66 per cent to 68 per cent, superior vena cava 75 per cent to 68 per cent, femoral artery 100 per cent.

She was readmitted February 13, 1959 to March 14, 1959. In the interim she had rapidly deteriorated, developing extreme dyspnea and orthopnea. Arterial pulsation of the retinal arteries was a prominent finding. The neck vessels showed collapsing pulsations of a free aortic insufficiency. The physical findings of the heart were as noted previously, except that both the systolic and diastolic murmurs now were accompanied by thrills over the left second and third interspaces.

Blood pressure was 150/10-0 mm. Hg. The lungs were clear. The liver and spleen could not be felt. Duroziez murmur, Corrigan pulse, and capillary pulsations were obvious. Several blood cultures were negative. A retrograde aortogram showed reflux from the aorta into the left ventricle. There was no evidence of left to right shunt.

With a preoperative diagnosis of congenital aortic insufficiency, she was operated on February 27, 1959. The chest was opened through a median sternotomy. Exploration disclosed striking pulsations of the aorta. An intense diastolic thrill was palpable over the base. Total cardiopulmonary by-pass was performed employing a disc oxygenator. Following cross-clamping of the aorta, the coronary arteries were perfused with hypothermic blood to induce cardiac arrest. The aorta was incised vertically, opposite the non-coronary cusp, and the aortic valve brought under direct vision. The aortic cusps were asymmetrical, the left being the smallest and the right the largest. The right cusp was prolapsed into a ventricular septal defect 3.0 to 3.5 cm. in diameter. It was adherent on its under surface to the inferior rim of the defect (Fig. 1A). Adhesions of the cusp were lysed. The ventricular septal defect was closed by direct suture. The free margin of the right cusp was shortened, and the posterior commissure tightened by suture. During the period of repair the coronary arteries were twice directly cannulated and perfused with cold blood. The aortotomy was closed following a third coronary perfusion with warm blood. Following release of the aortic clamp, ventricular fibrillation occurred. It was reversed by electric shock. After restoration of sinus rhythm the chest was closed. The patient was returned to the recovery ward in good condition. Direct blood pressure in the radial artery was 130/50 mm. Hg. preoperative and 130/80 postoperative.

The patient had an uneventful recovery and left the hospital on the fifteenth postoperative day. Her blood pressure was 150/86. A Grade III systolic and Grade II diastolic murmur were heard at the base with no accompanying thrills. Peripheral findings of aortic insufficiency were not present. Within two months she was able to engage in such activity as horseback riding without symptoms. She has been followed for six months and continues to do well.

Comment.—In this case, catheterization failed to demonstrate the ventricular septal defect. The subluxated aortic cusp attached to the lower rim of the septal defect must have effectively occluded the interventricular communication. The physical findings during the second admission indicated an increase in the aortic insufficiency. The hemodynamic changes seem to be reciprocal: The interventricular defect diminished, the aortic insufficiency augmented, by the increasing herniation of the aortic valve cusp. The successful operative result is unique among the reported cases.

Bicuspid Aortic Valve

The incidence of bicuspid aortic valve as reported by Abbott[6] is 1.3% of congenital heart disease. Deformed bicuspid valves may escape detection on gross examination due to the marked deformity and sclerosis which occasionally obliterate all normal landmarks. Lewis and Grant[7] in their classic pathologic description of this anomaly showed that in spite of deformity or fusion of the commissures all normal tissue layers could be microscopically demonstrated. The deformity is due to subendothelial whorls of fibrous tissue which later may become sclerotic and calcified. This anomaly, therefore, can result in either a normal appearing and functioning bicuspid valve or one severely stenotic and deformed. Associated congenital cardiovascular lesions occur in 80 per cent of the cases and include coarctation of the aorta, patent ductus arteriosus, defects of the ventricular septum, and anomalies of the pulmonary valve.

Complications may result in dynamic aortic stenosis or insufficiency. Aortic insufficiency is often seen in those cases with associated coarctation of the aorta and resultant systemic hypertension.[6] Another complication of bicuspid aortic valve is aneurysm of the sinus of Valsalva and rupture.

The most widely recognized and the most serious complication, exemplified by our case, is subacute bacterial endocarditis. The fact that these valves are deformed, even though minimally, undoubtedly accounts for the high incidence, 26 per cent of associated subacute bacterial endocarditis.[8]

Conversely, Lewis found that 23 per cent of an unselected group of patients with subacute bacterial endocarditis had bicuspid aortic valves.[7]

Case 2. A twenty-four-year-old woman was admitted January 3, 1958 to February 22, 1958, in the eighth month of pregnancy, with a history of three weeks of chills and fever. "Black and blue" marks that she interpreted as bruises, had appeared on the hands and feet. She complained of tenderness in the fingertips. She had known of no previous murmur or heart disease. A diagnosis of idiopathic epilepsy was established at age sixteen. Dilantin reduced the frequency of her grand mal seizures. She had one uneventful pregnancy two years previously. No cardiac abnormality was noted at that time.

On admission in January 1958, numerous petechiae and ecchymoses were apparent. There were small hemorrhages in the retinae. Blood pressure was 124/40 mm. Hg. The heart was not enlarged; no thrill was noted. There was a Grade IV basal diastolic murmur, characteristic of aortic insufficiency, associated with a Grade III systolic murmur, both transmitted into the neck vessels. The lungs were clear. Tumor of pregnancy was

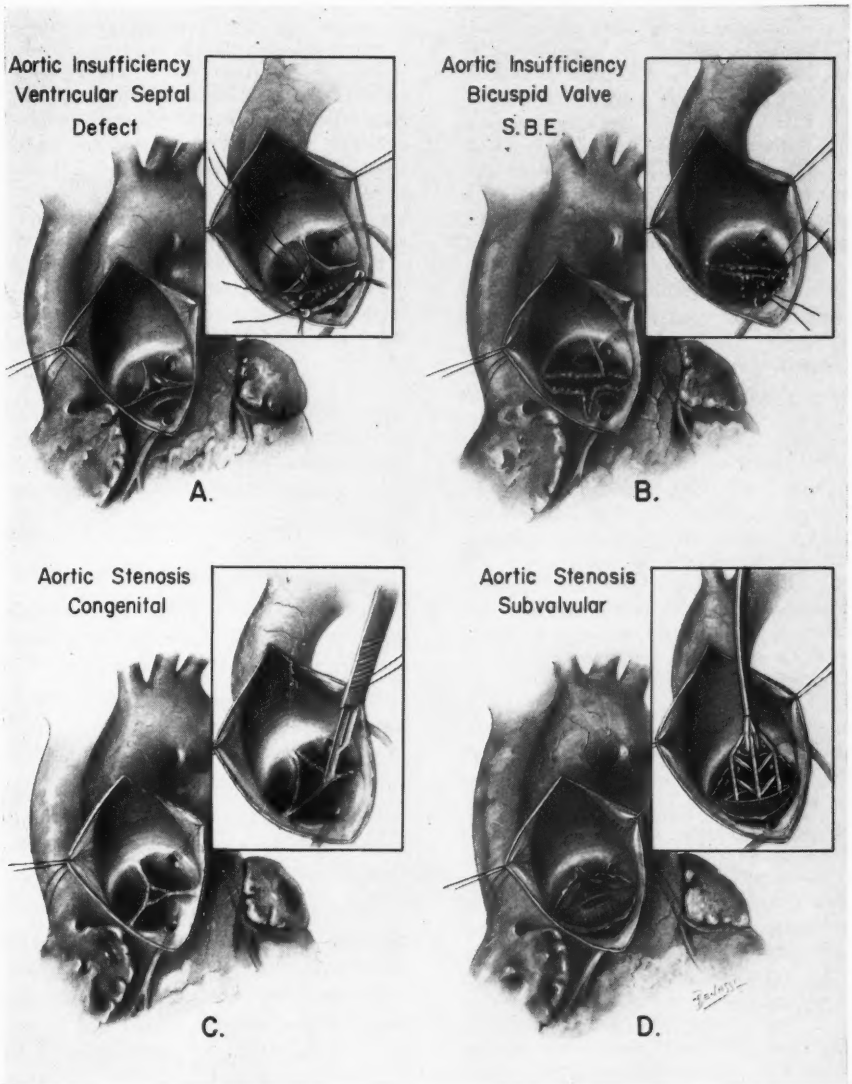


Fig. 1. Drawings showing the appearance of aortic valve area after exposure and during repair.

evident. Liver and spleen could not be felt. The hemoglobin was 11 Gm. per cent; 3,000,000 erythrocytes/mm.^{3}; and the erythrocyte sedimentation rate was 75 mm./hr. The white blood count was 11,000/mm.^{3}; 84 per cent neutrophiles, 16 per cent lymphocytes. The electrocardiogram was normal except for sinus tachycardia, 105/min. Three blood cultures revealed an alpha streptococcus sensitive to penicillin. Electroencephalogram revealed a diffuse abnormality with no focal findings. The temperature was 99.6 and she remained mildly febrile for three days. The intern's* admitting diagnoses were: (1) Pregnancy in the eighth month, (2) Epilepsy, (3) Congenital heart disease with subacute bacterial endocarditis. (In his words, "Could this be a congenital bicuspid aortic valve with SBE?") She was treated with penicillin and streptomycin for four weeks with no further fever and numerous negative blood cultures after the third day. Uneventful spontaneous delivery of a normal infant occurred on the twenty-fourth day of admission. Her diastolic blood pressure gradually dropped and at the time of discharge the readings were 120-140/16-20 mm. Hg.

She was readmitted May 9, 1958 to June 3, 1958. Dyspnea, orthopnea, cough and edema became apparent in late April, 1958. She was in obvious heart failure. Blood pressure was 130/20. The neck veins were distended and carotid pulsations were marked. Rales were heard at both lung bases. The heart was greatly enlarged. The rate was regular at 120. The murmurs had not changed. The liver and spleen were greatly enlarged. Pre-tibial edema was present. The hemoglobin was 12.3 Gm. per cent, white blood count 9,500/mm.^{3} with a normal differential; sedimentation rate 4 mm./hr. The urine was negative. Numerous blood cultures were sterile. She was afebrile. Chest x-ray showed great increase in heart size to the left, and marked pulmonary vascular engorgement. The electrocardiogram revealed a left strain pattern. The patient responded poorly to the usual management for congestive heart failure. Although the signs of pulmonary congestion diminished, she continued to show some edema and hepatomegaly.

With the diagnosis of aortic insufficiency following subacute bacterial endocarditis she was operated on June 8, 1958. The chest was entered through a bilateral thoracotomy with section of the sternum at the level of the fourth interspace. In the right hemithorax there were 100 ml. of straw-colored fluid. The heart was markedly enlarged extending to the left chest wall. A diastolic thrill was palpable over the base of the aorta. Cardiopulmonary by-pass was performed employing a disc oxygenator. The aorta was cross-clamped and the heart was arrested with potassium citrate in heparinized blood. Aortotomy revealed a bicuspid, frayed, fenestrated, and obviously extremely incompetent aortic valve (Fig. 1B).

Restoration of valve competence was attempted by suture of the fissure and cusp perforations. The commissures were reinforced by suture. Coaptation appeared to be improved. Heart action resumed in one and one-half minutes and remained regular and forceful for ten minutes, only to become feeble and ineffective thereafter. Resuscitative measures including electric defibrillation were conducted during the next two and one-half hours. The heart beat then became regular and forceful. The chest was closed and the patient removed to the recovery room. The blood pressure was 120/60.

Two hours postoperatively she had not regained consciousness. She died five hours postoperatively.

Autopsy showed cardiac hypertrophy and extreme dilatation. The heart weighed 430 Gm. Soft, greyish-pink vegetations were present on the free margins of a bicuspid valve. A circular perforation of one cusp was closed by suture. Tension produced by the suture of another perforation had produced a tear in the thin-walled cusp adjacent to the line of repair. Two of the knots had loosened, one in the anterior commissure and a second at the upper margin of the fissure.

Pulmonary congestion was present with atelectasis.

Four thousand cubic centimeters of fluid were present in the peritoneal cavity. Chronic passive congestion of the liver was marked.

Comment.—This case demonstrates the rapid deterioration that occurs following subacute bacterial endocarditis with perforation of a bicuspid aortic valve. Operation was done under desperate circumstances in an attempt to correct a valvular deformity which was incompatible with life.

Congenital Aortic Valvular Stenosis

Aortic valvular stenosis represents about one to two per cent of congenital heart disease.[9,10] It is occasionally associated with other cardiovascular defects, especially patent ductus arteriosus or coarctation of the aorta.[11]

Relatively severe stenosis and obstruction may be present without symptoms.[12,13] Vertigo and syncope are ominous and may portend sudden death. However, sudden death can occur without previous symptoms. Failure is rare.

Physical findings include a systolic thrill accompanying a harsh, widely distributed murmur, diamond-shaped on the phonocardiogram. The murmur and thrill are maximal immediately to the right of the sternum at the first or second interspace. The intensity of the second aortic sound has not proved to be useful in differentiating subvalvular from valvular stenosis. The peripheral pulse and pulse pressure may be small. Arterial tracings show a slow rise to the peak of systole, often with an anacrotic notch or slur, or a double systolic peak.[14] Left ventricular strain or hypertrophy is the characteristic electrocardiographic finding. X-ray and fluoroscopic studies may disclose enlargement of the left ventricle, sometimes

*Dr. Fred Lyon, now a Fellow in Obstetrics and Gynecology at the University of Minnesota Hospitals.

with aortic dilatation and occasionally with a small aortic knob. Calcification of the valve is absent.[15]

In a group of eight patients[13] the cusps were thickened and fused with an average orifice of 8 mm. At times the commissures were irregularly fused with the orifice in an eccentric position. The margins of the cusps were thickened and firm, but in no instance was calcification found.

Indications for surgery include syncope, vertigo, easy fatigability or reduced exercise tolerance, cardiac enlargement, marked left heart strain, a systolic gradient over 50 mm. Hg.[14] across the aortic valve with a normal or decreased cardiac output. Surgical approaches include the transventricular route,[16] direct vision exposure with hypothermia[13] and with a pump-oxygenator.[17]

Case 3. A thirty-seven-year-old farmer's wife was admitted February 12, 1957 to February 27, 1957. She complained of spells of amnesia beginning in January, 1957. Two such attacks lasting ten to fifteen minutes occurred while she was walking but not particularly exerting herself. For two years she had mild pain in the chest with exertion, relieved by rest. During this period she was somewhat breathless on exertion. There was no history of rheumatic fever. In 1940, she had had an appendectomy elsewhere. At that time her blood pressure was 100/80 mm. Hg. A loud systolic murmur and thrill were present at the base of the heart. Heart size and four lead electrocardiogram were normal. The diagnosis was congenital subaortic stenosis.

On examination February 12, 1957, the blood pressure was 110/90 mm. Hg. The heart was not enlarged. There was a systolic thrill at the base. The first sound was effaced by a holosystolic Grade VI murmur all over the precordium. The second sound was clearly heard at the base of the heart. The systolic murmur was maximal over the base but also transmitted throughout the chest and into the neck vessels. Femoral pulses were markedly diminished; pedal and radial pulses, practically absent. Twelve lead electrocardiogram showed changes characteristic of a left strain pattern. Chest x-rays showed slight prominence of the left ventricle, small aortic knob, and no valvular calcification. The electroencephalogram was normal. With the preoperative diagnosis of congenital aortic stenosis, surgery was elected on February 16, 1957.

The chest was entered through a bilateral thoracotomy and transverse sternotomy at the level of the fourth interspaces. The ascending aorta was enlarged and an intense systolic thrill was palpable over the base. Total cardiopulmonary by-pass was performed employing a bubble oxygenator. The aorta was cross-clamped, and the heart arrested with potassium citrate in heparinized blood. Aortotomy was done exposing the aortic valve. Three cusps were evident. The commissures were densely fused, with an orifice of approximately 7 mm. in greatest diameter. No calcification was encountered. With sharp dissection the commissures were accurately developed to the annulus producing an aortic orifice of 2.5 to 3.0 cm. (Fig. 1C). The aortic incision was closed, the cross-clamp removed, and heart action restored.

The patient has been obsrved for two years. She has had no further syncope, angina pectoris, or breathlessness. She is able to do her housework on the farm. She can walk stairs without pain. No thrill is apparent. A Grade I systolic murmur is heard at the base. Blood pressure is 118/90 mm. Hg. A Grade II basal diastolic murmur, high-pitched, is audible at the base. Electrocardiograms continue to show left strain pattern.

Comment.—This is an example of congenital aortic stenosis. The systolic murmur was first found at age nineteen and the symptoms appeared at thirty-five years.

Valvuloplasty under direct vision was done with good restoration of the aortic orifice. Evidence for minimal aortic insufficiency appeared postoperatively. An excellent clinical result was obtained.

Subvalvular Aortic Stenosis

Among forty operations for aortic valve disease, Brock[18] found five subvalvular aortic stenoses and concluded that this condition is more frequent than commonly thought. The mortality of symptomatic congenital aortic stenosis is high.[19] Of seventy-three patients with congenital valvular or subvalvular aortic stenosis, eight expired during an observation period of eight years. Five of these eight patients died suddenly, and all were under sixteen years of age.

Congenital subvalvular aortic stenosis must be differentiated from the acquired or functional type.[20] The latter is the result of long-standing systematic hypertension and is regarded as inoperable because the hypertrophic changes involve the entire left ventricle. Functional subaortic stenosis has two characteristics: onset of symptoms late in life, and evidence of aortic dilatation.[21,22]

Differentiation between valvular and subvalvular aortic stenosis is difficult. Catheter withdrawal curves are helpful but not infallible since the subvalvular chamber may be too small to reflect significant pressure changes.[20] Calcification of the aortic valve area, although not an entirely reliable sign, suggests acquired valvular stenosis. Angiography may assist in the diagnosis. Exposure of the aortic valve appears to be the only reliable way of establishing the pathological anatomy.

Transaortic, direct vision exposure of the aortic valve under hypothermia,[13,23] or with cardiopulmonary by-pass[17] appears to us to be the best surgical approach.

Case 4. A thirty-year-old farmer was admitted April 6, 1959 to April 11, 1959, and again May 25, 1959 to June 14, 1959.

His complaints were attacks of weakness, faintness, and dizziness with exertion, occurring about once a month for five months. He was never unconscious and had never "blacked out." There was no history of rheumatic fever. At age fourteen a murmur was first heard. At that time he had an abscess of the left hip requiring several operations for drainage. This was associated with an undiagnosed febrile illness.

Blood pressure on admission was 116/60 mm. Hg. No cyanosis or clubbing was noted. Neck vessels did not pulsate. The heart was enlarged to the left. A Grade VI murmur at the base replaced the heart tones. It was low in pitch and accompanied by a notable thrill. The murmur was transmitted all over the upper half of the body. There was also a Grade II diastolic murmur suggestive of aortic insufficiency heard at the base. The electrocardiogram showed a left strain pattern. Chest x-ray and fluoroscopy revealed some left ventricular enlargement but no valvular calcification. Direct puncture of the left ventricle revealed a pressure of 155/0 mm. Hg. as compared with simultaneous direct radial artery pressure of 85/45. There was a systolic gradient of 70 mm. The pulse was not remarkable. Phonocardiogram showed a diamond-shaped systolic murmur replacing heart sounds at the base.

The patient returned to the hospital for surgery on May 25, 1959. The physical findings were essentially the same. The transverse diameter of the heart on x-ray had increased by 2 cm. He was digitalized with Digoxin, 2.5 mg. in two days.

With the preoperative diagnosis of congenital aortic stenosis surgery was done on June 3, 1959. The chest was opened through a median sternotomy. The pericardium contained 1,500 ml. of dark blood, a legacy of the previous left ventricular puncture. A rough, intense thrill was palpable over the base of the enlarged ascending aorta. Total cardiopulmonary by-pass was instituted employing a disc oxygenator. The aorta was cross-clamped. Aortotomy brought the aortic valve under direct vision. This was entirely normal. The index finger was passed into the left ventricle encountering the pathology. Approximately 15 mm. below the aortic valve there was a fibrous diaphragm-like structure narrowing the outflow tract to an opening scarcely admitting the finger. The lesion was clearly visualized by retracting the aortic cusps. The operative field continued to be bloody and accordingly the stenosis was relieved with a Brock valvutome, rather than by excision of the subaortic stenotic zone (Fig. 1D). The subaortic opening now readily admitted two fingers. The aortic wound was closed and normal heart action restored. Simultaneous recording of the blood pressure in the radial artery and the left ventricle showed no systolic gradient across the aortic valve.

The postoperative course was favorable and on the eleventh postoperative day the patient was discharged. At the time of discharge from the hospital blood pressure was 110/70 mm. Hg. The systolic murmur was reduced to grade II with no thrill. The diastolic murmur was still present. Peripheral pulses were normal. Three months later he felt well and had started doing some farm work.

Comment.—This is a case of congenital subaortic stenosis. Preoperative direct left ventricular puncture was complicated by hemopericardium. The pathology was discovered only by direct surgical exposure. Technical problems precluded what is probably the ideal management of this lesion, excision of the stenotic area. The method employed resulted in complete removal of the obstructive gradient. The clinical result over a short follow-up has been excellent.

Summary

Four cases of various types of congenital aortic valvular deformities are presented. Problems of diagnosis and medical and surgical management are discussed.

References

1. Scott, R. C., McGuire, J., Kaplan, S., Fowler, N. O., Green, R. S., Gordon, L. Z., Shebatai, R., and Davolos, D. D.: The syndrome of ventricular septal defect with aortic insufficiency. Am. J. Cardiology, 2:530, 1958.
2. Denton, C., and Pappas, E. G.: Ventricular septal defect and aortic insufficiency. Am. J. Cardiology, 2:554, 1958.
3. Nellen, M., Schrire, V., and Vogelpoel, L.: Ventricular septal defect with aortic incompetence. S. African M. J., 33:91, 1959.
4. Garamella, J. J., Cruz, A. B., Jr., Heupel, W. H., Dahl, J., Jensen, N. K., and Berman, R.: Ventricular septal defect with aortic insufficiency: Successful surgical correction of both defects by the transaortic approach. Am. J. Cardiology. In Press.
5. Gross, R. E.: The patent ductus arteriosus: Observations on diagnosis and therapy in 525 surgically treated cases. Am. J. Med., 12:472, 1952; The Surgery of Infancy and Childhood. Philadelphia: Saunders, 1953.
6. Abbott, M. D.: On the Relative Incidence and Clinical Significance of Congenitally Bicuspid Aortic Valve, with Five Illustrative Cases: Libman Anniversary Volume I. New York: International Press, 1932.
7. Lewis, T., and Grant, R. T.: Observations relating to subacute infectious endocarditis. Heart, 10:3, 1923.
8. Wood, Paul: Diseases of the Heart and Circulation. P. 345. London: Lippincott, 1956.
9. Abbott, M. D.: Atlas of Congenital Cardiac Disease. American Heart Association, New York, 1936.
10. Nadas, A.: Pediatric Cardiology. Philadelphia: W. B. Saunders Company, 1957.
11. Smith, D. E., and Mathews, M. D.: Aortic valvular stenosis with coarctation of the aorta, with special reference to the development of the aortic stenosis upon congenital bicuspid valves. Brit. Heart J., 17:198, 1955.
12. Marquis, R. M., and Logan, A.: Congenital aortic stenosis and its surgical treatment. Brit. Heart J., 17:373, 1955.

(Additional references on Page 1647)

The Treatment of Fractures of the Femoral Shaft

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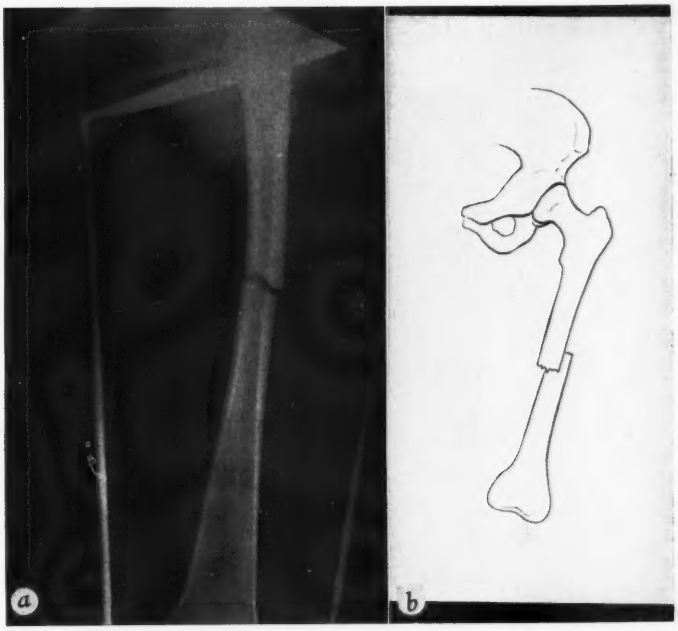


Fig. 1(a) and (b). Transverse fracture of the midshaft of the femur. The ideal type for fixation with an intramedullary nail.

● *Modern gadgetry, in both medicine and other fields, often is not an unmixed blessing. This review emphasizes that such things as intramedullary nails for the repair of femoral fractures often are of great help but may have associated disadvantages and complications when used incorrectly.*

Read at the meeting of the Minnesota Surgical Society, Duluth, July 17, 1959.

THE USE of the intramedullary nail for the treatment of fractures of the femoral shaft did not become practical and extensive until after World War II. As early as 1886,[1] however, several pioneer surgeons had attempted this method, using various materials such as steel rods and ivory and bone pegs, but with only limited success.

As is often the case in surgery, when an attractive, revolutionary and obviously effective surgical procedure is developed for a difficult problem, the procedure is likely to be used indiscriminately. Such has been true of the intramedullary nail in fractures of the femoral shaft.

To quote Hugh Smith: "Given the proper indications, intramedullary fixation is the most effective form of therapy for many fractures of the shaft of the femur." To continue the quotation: "This technique if applied to improperly selected cases or if inefficiently or unskillfully carried out, offers more possibilities of trouble than any other."[2]

I should like to review the indications for and advantages of the intramedullary nail, as well as to emphasize some of its disadvantages, contraindications and the complications inherent in its use.

I should like also to review the older methods of treatment, both closed and open, and to mention

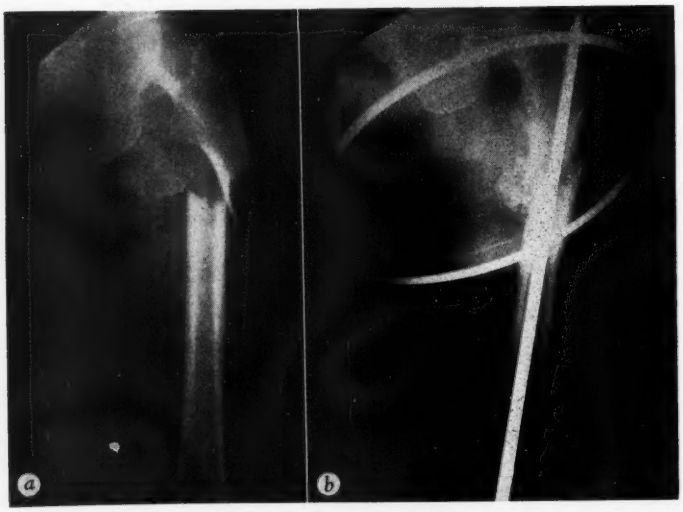


Fig. 2(a) Preoperative and (b) postoperative views of pathologic fracture (adenocarcinoma of breast) of the upper femoral shaft treated with an intramedullary nail. (Bone graft also done at time of operation.)



Fig. 3(a) and (b). Fracture of the lower part of the femoral shaft (two months postoperatively). Note the increasing diameter of the intramedullary canal below this level.

some of the advantages of these methods over the use of the intramedullary nail in fractures of the femoral shaft.

roughly, the middle third of the femoral shaft.

Experienced surgeons are able to expand these limitations somewhat, particularly in the region

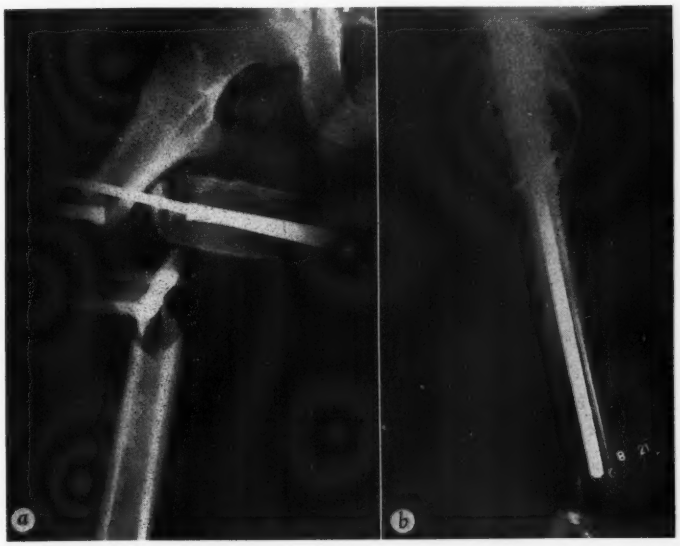


Fig. 4(a) Severely comminuted fracture of the femoral shaft treated with an intramedullary nail. Primary bone grafting of iliac bone also was done at the same procedure. (b) The result four months postoperatively.

Intramedullary Nail

The great advantage of the intramedullary nail is that it provides efficient immobilization of the fracture in anatomical reduction, and yet allows early motion of the hip and knee, and prompt ambulation with weight-bearing on the fractured extremity.

Joint stiffness and muscle wasting therefore are markedly reduced, and long, expensive periods of hospitalization are shortened.

The ideal condition for the intramedullary nail is a fresh, transverse, simple fracture of the middle third part of the femoral shaft in an adult person[1] (Figs. 1*a* and *b*).

Certainly the advantages of the method can be employed in other situations, but the foregoing is the ideal indication.

The intramedullary nail immobilizes effectively by fitting snugly in the intramedullary canal. Obviously, therefore, it should be used only if the intramedullary canal is narrow enough to hold the nail. The intramedullary canal of the femur has been said to fulfill this requirement from a site about 2 inches below the lesser trochanter to a point 7 inches above the adductor tubercle or, of the lesser trochanter (Figs. 2*a* and *b* and 3*a* and *b*). In general, however, limitation of the use of the intramedullary nail to the middle third of the shaft is good practice.

As the age of the patient advances, the diameter of the intramedullary canal increases, sometimes so greatly that a snug fit cannot be obtained with the largest nail.

Use of the intramedullary nail in compound fractures of the femoral shaft should be subject to the same rigid restrictions which are imposed on the use of other internal-fixation devices in compound fractures.

It is far safer to perform the usual primary debridement and closure of the compound wound, immobilize the fractured femur in balanced traction, and await healing of the wound before intramedullary nailing is attempted, than it is to nail the fracture early and invite infection of the entire intramedullary canal.

Sometimes, while waiting for the compound wound to heal, the surgeon is surprised to find that the fracture already has begun to unite under traction, making intramedullary nailing unnecessary.

As mentioned previously, the transverse fracture in the middle third of the shaft is that type in

which the intramedullary nail can be used to greatest advantage. When this nail is fitted snugly, there is little tendency for rotation or shearing to occur at the site of fracture. Early weight-bearing not only can be permitted but should be encouraged to impact the fragments and to stimulate union.



Fig. 5. Fracture of the femoral shaft. The cortex of the distal fragment was split by an intramedullary nail which was too large in diameter for the intramedullary canal.

The intramedullary nail also can be used effectively in some oblique and comminuted fractures of the femur, but here, again, it should be used with rigid restrictions. The advantages of early mobilization and weight-bearing characteristic of the intramedullary nail may not be obtainable after oblique and comminuted fractures, and so early mobilization and weight-bearing should not be allowed (Figs. 4*a* and *b*).

Actually, in this instance the intramedullary nail should be considered no more than an internal splint to permit and maintain anatomical reduction. External immobilization in a plaster spica cast or suspension in a splint in bed is essential for adequate immobilization of the fracture, at least until early union is evident. Failure to recognize this limitation of the intramedullary nail in basically unstable oblique or comminuted fractures has resulted in unnecessary delayed union and nonunion and frequent unjustified criticism of this method of treatment.

In addition to the benefits of its use in fresh fractures, the intramedullary nail has very special advantages in the treatment of pathologic fractures or impending pathologic fractures of the femoral shaft.

Pain usually is well controlled and early ambulation is permitted when the nail is used, thus reducing the possibility of the complications resulting from inactivity.

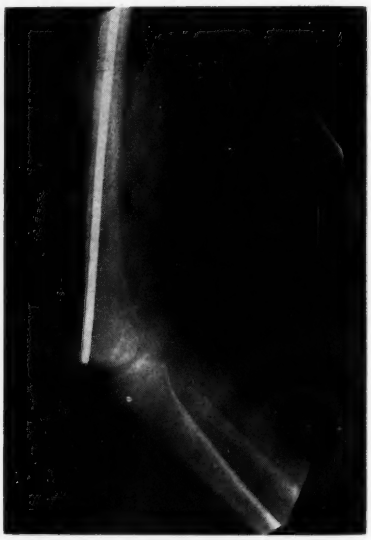


Fig. 6. Penetration of the knee joint by an intramedullary nail of excessive length.

In addition to metastatic lesions of bone from neoplasms of the breast, kidney, prostate and thyroid glands and gastrointestinal tract, lesions of the bone resulting from Paget's disease, hyperparathyroidism and osteogenesis imperfecta can be controlled successfully with the intramedullary nail.[3]

Thus far, no convincing evidence has been advanced that intramedullary nailing increases mechanical dissemination of tumor cells by increasing intramedullary pressure during insertion of the nail.[3]

Moreover, the presence of the intramedullary nail does not appear to reduce the irradiation delivered to a metastatic lesion of the bone, especially if more than one portal of entry for the rays is employed.

Disadvantages and Complications.—The greatest disadvantage to the use of the intramedullary nail is the fact that a surgical procedure is required to insert it. Although this is a disadvantage common to all operative methods, insertion of an intramedullary nail often can be particularly formidable. The closed or so-called blind method of nailing in which the nail is driven down the shaft without exposing the fracture is mentioned here only in passing, and only to condemn it—particularly when the procedure is done under fluoroscopic control.

A few of the reported complications resulting from the "blind" method are as follows: (1) roentgen-ray burns to the hands and face of the surgeon, (2) missing the distal fragment of the fracture with the nail, and (3) damage to the major vessels and nerves of the extremity.[2]

Complications which are peculiar to intramedullary nailing are as follows: (1) improper length and diameter of the nail, (2) cutting out of the cortex or splitting of the cortex by the nail, (3) breaking of the guide pin, (4) additional comminution of the fragments, (5) pain and swelling in the knee, (6) bending or breaking of the nail, (7) bursa formation over the end of the nail, (8) pain in the hip, (9) migration of the nail, and (10) distraction of the fragments (Figs. 5 and 6).[4]

Discussion of the actual operative technique is not within the scope of this presentation. However, most of the complications mentioned above as due to nailing can be prevented if four principles are observed.

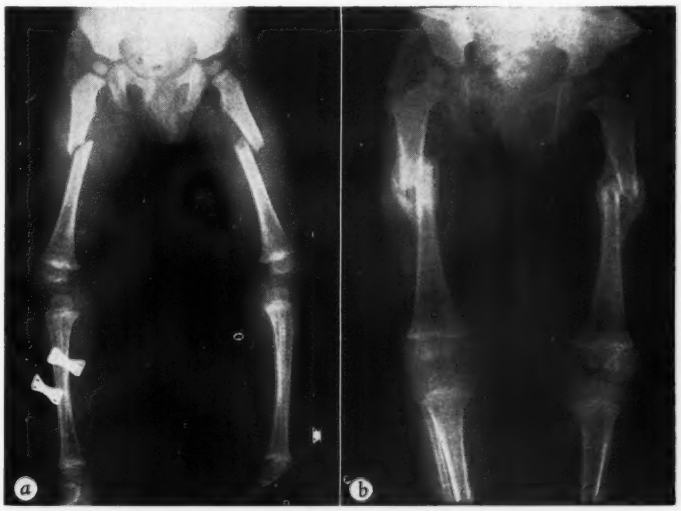


Fig. 7(a) Bilateral femoral fractures in a two-year-old child treated by traction. (b) Note extent of healing six weeks after the time of fracture.

First, open reduction is performed, the nail being carefully inserted into the proximal fragment and then driven into the distal fragment under direct vision.

Second, the proper length and diameter of the nail to be used are determined preoperatively by roentgen-ray measurement, the opposite femur serving as guide.

Third, the intramedullary canal is carefully reamed to the correct size before the nail is inserted.

Fourth, adequate roentgenograms are made during and immediately after insertion of the nail.

Closed Method

The closed method of treatment of fractures of the femoral shaft can be used in many situations in which the use of the intramedullary nail is contraindicated. The closed method consists of manipulation of the fracture into satisfactory position, usually with the use of anesthesia, and then maintenance of reduction with traction in a splint or by the use of a plaster hip spica cast.

However the reduction is maintained, manipulation of the fracture fragments usually must be performed first. In most cases traction alone cannot be expected both to reduce the fracture and to maintain reduction. Therefore, traction should

be considered a method of immobilization and not a method for obtaining reduction.[5]

Indications.—Closed reduction is the method of choice for badly comminuted or unstable oblique fractures, as previously mentioned (Figs. 8*a*, *b*, *c* and *d*).



Fig. 8. Comminuted fracture of the femur in an eighteen-year-old man treated by traction and a plaster hip spica. (a) January 24, 1958. (b) February 3, 1958. (c and d) June 20, 1958. Solid union took place five months after the treatment and the patient returned to work as a farmer.

choice for children, since persistence of open epiphyseal lines in the femurs of young patients prevents use of the nail because of the danger of interference with growth (Figs. 7*a* and *b*).

Closed reduction can be used when the fracture occurs toward either end of the femur, where adequate fixation with an intramedullary nail cannot be obtained.

The closed method, of course, is the one of

The greatest advantage of the closed method, in some respects, is that no open operative interference is required. In the presence of infection or when infection is likely to occur, no other method can compare with the closed method of treatment.

A number of ingenious traction splints have been devised for the fractured femoral shaft, but the Thomas splint with a Pearson knee attach-

ment probably is still the most effective and simplest to use. Traction can be achieved by the use of skin tapes or by a Steinmann pin or heavy

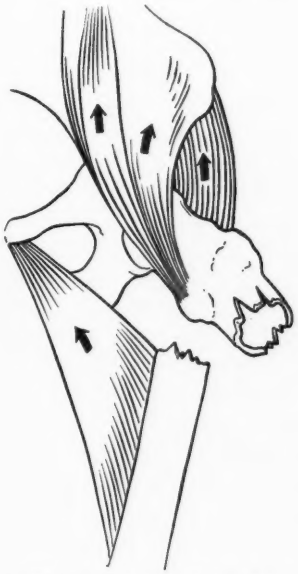


Fig. 9. Subtrochanteric fracture of the femur with displacement caused by muscular contraction.

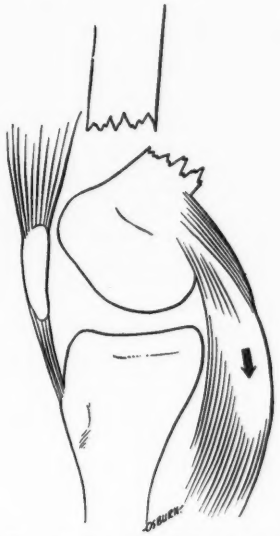


Fig. 11. Supracondylar fracture of the femoral shaft, with displacement.

Kirschner wire passed through the tibial tubercle. Skin traction in general is not so effective as skeletal traction, and cannot be used in the fragile-skinned, elderly patient or when more than ten pounds of traction is required.

Insertion of the skeletal traction device through the distal portion of the femur may damage the quadriceps mechanism and impair motion of the knee, and should be resorted to only in special circumstances, such as in displaced supracondylar fractures.

Disadvantages.—The greatest disadvantage to the closed method, whether it be the traction method or use of the spica cast, is the long time re-



Fig. 10. Healed subtrochanteric fracture treated by fixation with the use of a blade plate.

quired to obtain union of the fracture. Watson-Jones wrote that uninterrupted immobilization should be continued for twelve weeks before clinical and x-ray tests of union are made.[5] During these twelve weeks, however, constant, careful attention must be paid to the immobilized limb and frequent roentgenograms must be taken to be sure angulation has not occurred. Stiffness of the knee joint following four months of immobilization is another definite disadvantage of the closed method. In the young adult or middle-aged patient, however, this stiffness is only temporary and usually subsides completely with the resumption of active exercise. In the elderly patient, some degree of stiffness may be permanent but usually it is not a serious disability.

Other Open Methods

In some fractures of the femoral shaft, open reduction and internal fixation are indicated, yet



Fig. 12. Comminuted supracondylar fracture treated by means of crossed Rush pins and a screw. (a and b) February 17, 1955. (c and d) April 26, 1955.

the rigid prerequisites for use of the intramedullary nail cannot be met. Fractures at the subtrochanteric level are sometimes of this type. They are difficult to reduce and manage in traction because of flexion and abduction of the short proximal fragment. Communition and obliquity of the fracture line and the high level of the fracture may prevent use of the intramedullary nail (Fig. 9).

In such a situation, adequate internal fixation can usually be obtained with any one of several devices, in which a blade or three-flanged nail is inserted into the femoral head and neck and an attached plate is screwed to the shaft, immobilizing the fracture (Fig. 10).

Incidentally, this often-difficult procedure can be greatly facilitated by exposing the fracture with the patient in the lateral decubitus position, instead of supine on a fracture table.

Fractures through the distal third of the femoral shaft and supracondylar region constitute another group in which operative intervention is often necessary, and yet the intramedullary nail cannot be used because a snug fit in the intramedullary canal cannot be obtained (Fig. 11). The use of two intramedullary Rush pins, one inserted medially and one laterally through the femoral condyles, immobilizes transverse or essentially stable fractures at this level once reduction has been obtained (Figs. 12*a, b, c* and *d).*

Oblique or comminuted fractures often may be effectively stabilized with single or multiple screws. Occasionally, use of a plate and multiple screws or Parham bands may be indicated.

These devices should again be considered no more than internal splints. The need for external immobilization in the form of a plaster spica or traction splint cannot be overemphasized if nonunion is to be prevented.

When in doubt as to stability after internal fixation, one should apply a cast or immobilize the limb in a splint in bed until roentgenographic evidence of union occurs, regardless of the type of internal fixation used.

References

1. Peltier, L. F.: The treatment of fractures of the shaft of the femur by intramedullary nailing. Bull. Univ. Minnesota Hosp., 23:445-451 (Apr. 18) 1952.
2. Watson-Jones, Reginald; Bonnin, J. G.; King, Thomas; Palmer, Ivar; Smith, Hugh; Vaughan-Jackson, O. J.; Adams, J. C.; Burrows, H. J.; Nicoll, E. A.; vom Saal, Frederick; Trevor, David; and Le Vay, A. D.: Medullary nailing of fractures after fifty years: With a review of the difficulties and complications of the operation. J. Bone & Joint Surg., 32B:694-729 (Nov.) 1950.
3. Johnson, E. W.: The uses and abuses of intramedullary nails. South Dakota J. Med. & Pharm., 10:207-211 (June) 1957.
4. Lottes, J. O., and Key, J. A.: Complications and errors in technic in medullary nailing for fractures of the femur. Clin. Orthop., 2:38-49, 1953.
5. Watson-Jones, Reginald: Fractures and Joint Injuries. Ed. 4, vol. II, pp. 445-1073. Baltimore: Williams & Wilkins Company, 1955.

Prophylactic Value of Anticoagulant Therapy in Cerebral Thrombosis

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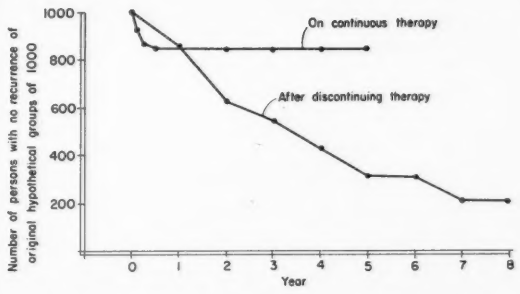


Fig. 1. CVA—First non-fatal recurrence: Number of persons with no recurrence on therapy and number with no recurrence after discontinuing therapy.

THE USE OF anticoagulants in the treatment of cerebral vascular disease has been receiving increasing attention in recent years. Recent reports by Millikan, Siebert and Whisnant,[1] as well as McDevitt, Carter, Gatje, Foley, and Wright[2] have reviewed the experience to date. The former authors have reported favorable results in the elimination of recurring episodes of insufficiency in the vertebral-basilar and carotid arterial systems and have found probable benefit in thrombosis in the vertebral-basilar system with infarction and in actively advancing occlusion of the carotid system. They have, however, suggested the inadvisability of the treatment in "complete" lesions.

The McDevitt group report substantial reduction following the use of anticoagulants in the rate of recurrent thrombosis in a long term study in patients with rheumatic heart disease, hypertensive-arteriosclerotic disease and other miscellaneous conditions.

Fisher[3] has reported similar results in a study of fifty-eight cases, particularly with reference to improvement in transient ischemic attacks. The above studies have been brought together in the report of the second Conference on Cerebral Vascular Diseases.[4]

Materials and Method

The present study is an evaluation of the results of anticoagulant therapy in patients treated in private practice since 1950. The method has been described in detail in a report on the results of anticoagulant therapy in a variety of thromboembolic conditions of which the present group of patients forms a part.[5]

In brief, the method consisted in preparing a code sheet of eighty items on which to record the desired data. These data were then transferred to IBM punch cards for counting and sorting analysis.

The general structure of the study has been to measure the total period of observation for each patient from the date of inclusion in the study. This time period was then subdivided for each case into an initial period called the "duration of continuous treatment" and a succeeding period called the "period of observation after the first discontinuance of treatment."

First non-fatal recurrences while on continuous treatment were recorded on the time scale measuring the duration of continuous treatment. First non-fatal recurrences after discontinuing therapy were recorded on the time scale measuring the period after the first discontinuance. Similar measures of mortality were made.

The rates of first non-fatal recurrence and death on and after discontinuing treatment were determined. The results were then recast into the form of survivorship tables after the method of Hill.[6]

Since no patients had resumptions of therapy in the absence of recurrence, a clear comparison of the incidence of first non-fatal recurrence on treatment can be made with the incidence after discontinuing therapy. Since many of the patients who discontinued therapy had resumptions following a non-fatal recurrence, the group who discontinued treatment may be viewed as being on intermittent therapy. It is possible that these resumptions may have increased the number of survivors in the group who discontinued treatment.

TABLE I. COMPARISON OF DISCONTINUED AND NEVER DISCONTINUED GROUPS DIAGNOSTIC CATEGORIES

	Observed After Discontinuing Therapy		Never Discontinued Therapy	
	No. Pts.	%	No. Pts.	%
Carotid				
Transient	3	8	3	16
Progressive	15	38	3	16
Complete	5	12		
Partial and static	6	15	3	16
Vertebral				
Transient	1	2	1	5
Progressive	7	18	5	26
Unclassifiable	2	5	3	16
Other CVA	1	2	1	5
Total	40		19	

anticoagulant therapy (the treated group) with a group of forty patients observed after discontinuing therapy (the discontinued group).

The treated group was composed of nineteen cases who were on treatment throughout the entire period of observation (the never discontinued group) and thirty-nine patients who were on treatment for some period of time and then discontinued. The discontinued group consisted of these thirty-nine patients plus one case whose initial treatment included only heparin, but who was coded as having been observed after discontinuing therapy.

TABLE II. COMPARISON OF DISCONTINUED AND NEVER DISCONTINUED GROUPS

Sex	Observed After Discontinuing Therapy				Never Discontinued Therapy			
	No. Pts.		%		No. Pts.		%	
Male	23		58		12		63	
Female	17		42		7		37	
Age	Male		Female		Male		Female	
	No. Pts.	%	No. Pts.	%	No. Pts.	%	No. Pts.	%
40-49			2	12			1	14
50-59	5	22	4	24	2	17	2	29
60-69	9	39	3	18	6	50	1	14
70-79	8	35	7	41	2	17	2	29
80-89	1	4	1	6	2	17	1	14
Average age	66.7		65.1		67.8		64.5	

TABLE III. COMPARISON OF DISCONTINUED AND NEVER DISCONTINUED GROUPS PRIOR THROMBOEMBOLIC CONDITIONS

	Observed After Discontinuing Therapy		Never Discontinued Therapy	
	No. Pts.	%	No. Pts.	%
Prior myocardial infarct	5	12	3	16
Prior angina pectoris	6	15	1	5
Prior CVA	10	24	6	31
Prior retinal thrombosis	2	5	1	5
No prior episode	21	52	11	58

Multiple classification possible.

Anticoagulant therapy was usually started in the hospital, although in some cases it was inaugurated on an out-patient basis. Office prothrombin times were determined as often as appeared to be necessary, usually once every three weeks as treatment became established. The Quick one-stage method was used. A therapeutic prothrombin time was defined as falling between eighteen and thirty-five seconds. The control was almost always twelve seconds or less.

The study consisted in a comparison of the results in a group of fifty-eight patients on continuous

The patients in the discontinued group were observed first on treatment and subsequently after discontinuing treatment. They therefore serve as a control for themselves, as far as sex, age, prior thromboembolic episodes and associated diseases are concerned. A comparison of the never discontinued group (those patients represented only in the treated group) with the discontinued group (those represented in both groups) characterizes the entire sample. To justify the use of the discontinued group as a control, it is necessary to demonstrate that the nineteen patients in the never

TABLE IV. COMPARISON OF DISCONTINUED AND NEVER DISCONTINUED GROUPS ASSOCIATED PATHOLOGICAL CONDITIONS

	Observed After Discontinuing Therapy		Never Discontinued Therapy	
	No. Pts.	%	No. Pts.	%
Hypertension	26	65	10	53
Abnormal EKG	16	40	8	42
Auricular fibrillation	6	15	3	16
Enlarged heart	4	10	2	11
Cardiac decompensation	4	10	1	5
Diabetes	4	10	1	5
Valvular disease	2	5	2	11
Renal insufficiency	0	0	3	16

Multiple classification possible.

discontinued group are comparable to the group who discontinued treatment.

Table I describes the initial diagnoses in the two groups. Table II indicates that there was very little difference in the sex and age composition of the two groups. There were more males in each group and the males were somewhat older. The incidence of prior thromboembolic conditions and angina pectoris is shown in Table III. The never discontinued group has a higher percentage

TABLE V. FIRST NON-FATAL RECURRENCE ON CONTINUOUS THERAPY

Time Interval[1]	Observed Percentage With No Recurrence	No. With No Recurrence / No. Exposed to Risk	No. With No Recurrence Out of Every 1000 Pts.
0	92.5%	49/53	1000
1 month	94.5	35.5/37.5	925
3 months	96.1	25/26	874
6 months	100	19/19	841
12 months	100	12/12	841
24 months	100	5.5/5.5	841
36 months	100	3/3	841
48 months	100	1.5/1.5	841
60 months			841
AFTER DISCONTINUING THERAPY			
Time Interval[2]	Observed Percentage With No Recurrence	No. With No Recurrence / No. Exposed to Risk	No. With No Recurrence Out of Every 1000 Pts.
0	85.3%	29/34	1000
12 months	73.3	16.5/22.5	853
24 months	86.7	13/15	625
36 months	77.8	7/9	542
48 months	75.0	3/4	422
60 months	100	3/3	316
72 months	66.7	2/3	316
84 months	100	1/1	211
			211

[1]Time measured from date of inclusion in study.
[2]Time measured from date of discontinuance of therapy.

of prior thromboembolic conditions, but a smaller incidence of angina pectoris. The incidence of various associated conditions known to have been present at the time of inclusion in the study is listed in Table IV. Again, there is very little difference in the two groups, although the discontinued group has a somewhat higher percentage of cases with hypertension. The above tables suggest that the nineteen cases in the never discontinued group are sufficiently similar to the discontinued group to warrant their inclusion in the treated group as a whole.

Results

In the treated group there were a total of seven first non-fatal recurrences, all occurring during the first six months. Of these, two occurred with a therapeutic prothrombin time and five with a subtherapeutic prothrombin time. In the group who discontinued treatment there were seventeen non-

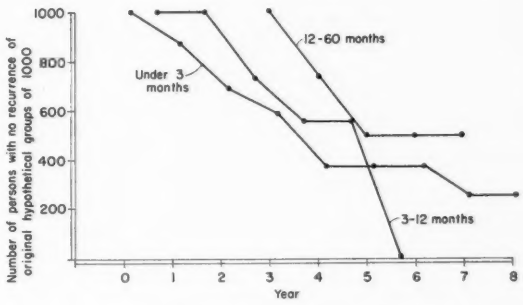


Fig. 2. CVA—Rate of first non-fatal recurrence after discontinuing therapy in persons with different duration of initial treatment (zero to three, three to twelve, twelve to sixty months).

fatal recurrences, with five in the first year after discontinuance and six in the second year.

The incidence of first non-fatal recurrence, on and after discontinuing therapy, is shown in life table form in Table V. The first column indicates the time at which each interval begins. The second column shows the observed percentage with no recurrence during the time interval. The third column presents the ratios from which these percentages were determined. The fifth column shows the estimated number of persons of an original hypothetical group of 1,000 who would have been free of recurrence at the successive times indicated. Figure 1 represents the same data graphically.

In patients on continuous therapy the incidence of recurrence was high during the first month and fell rapidly to zero at the end of six months. It is during this six month period that the recurrences with subtherapeutic prothrombin time were found. Following discontinuance of therapy the incidence of recurrence appeared to be high and to remain high throughout the period of observation.

There has been no useful guide to date as to how long anticoagulant therapy should be continued. To determine whether the recurrence rate after discontinuance is affected by the length of initial treatment, the group was split into those cases who discontinued after different lengths of initial treatment, and the estimated number with no recurrence at successive time periods is shown in Figure 2. The curve for the group with brief treatment (zero to three months) is based on a group of 15.5 cases exposed to the risk of having a

first non-fatal recurrence after discontinuing therapy. The group with intermediate duration of treatment (three to twelve months) is based on

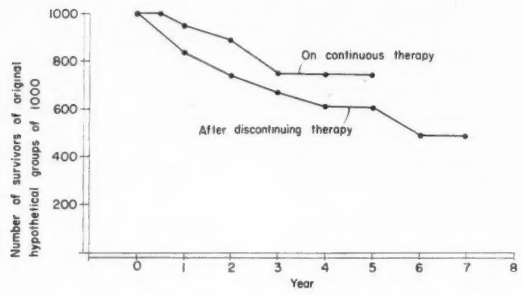


Fig. 3. CVA—Number of survivors on continuous therapy and number of survivors after discontinuing therapy.

nine cases and the group with prolonged treatment (twelve to sixty months) is based on 9.5 cases. After discontinuing therapy the incidence of recurrence was high regardless of the duration of the initial treatment.

TABLE VI. COMPLICATIONS OF TREATMENT

	Number of Patients	%
Severe melena	1	2
Mild hematuria	4	7
Mild ecchymosis	5	9
Mild melena	3	5
Easy bleeding	6	10
Mild hemoptysis	1	2
No complications	46	79

There were three deaths in the treated group, one in each of the first three years. There were thirteen deaths in the discontinued group with six of them occurring in the first year after discontinuing therapy and three in the second year. The incidence of death in patients on continuous treatment and after discontinuing treatment is shown in Figure 3. It is to be recalled that some members of the discontinued group had resumptions of treatment following non-fatal recurrences.

The incidence of hemorrhagic complications is recorded in Table VI. There was only one major hemorrhagic episode and 79 per cent had no complications.

First and subsequent thromboembolic recurrences are itemized in Table VII. There were sixteen deaths in the entire group of which eleven were due to cerebral vascular disease.

Comment

It is to be noted that the recurrences among those on continuous therapy were dated from the onset of the cerebral thrombotic or ischemic episode. The episodes after discontinuing therapy were measured from the date of discontinuance. The first year on continuous therapy was broken into small time units. It is apparent that the tendency to recurrence was strong in the immediate post-thrombotic period, the probability of recurrence being 7.5 per cent in the first month. The next period (one to three months) is two months in duration and the probability of recurrence was 5.5 per cent or 2.75 per cent per month. The third period (three to six months) is three months long and the probability of recurrence was 3.9 per cent or 1.3 per cent per month. Thereafter the observed rate was zero. During the period of hospitalization the prothrombin time was in the therapeutic range about 82 per cent of the time, and after discharge from the hospital the prothrombin time was in the therapeutic range about 72 per cent of the time. Thus it would appear that the large number of recurrences with a subtherapeutic prothrombin time are occurring in a small proportion of the cases and would suggest that more intense early treatment might decrease the incidence of recurrences in the first few months.

TABLE VII. NATURE OF RECURRENCES

	1st Recurrence	2nd Recurrence	3rd or More Recurrences	Total	Per Cent of Total
Myocardial infarct	2	0	1	3	7.7
CVA	19	11	3	33	84.6
Phlebitis	1	0	0	1	2.6
Peripheral thrombosis or embolism	2	0	0	2	5.1
				39	

The plan of the study was such that all people who discontinued therapy became exposed to the risk of having a "first recurrence after discontinuing therapy" as of the date of their discontinuance. The pattern of recurrence in this group is quite different from that noted when they were on continuous therapy, in that the maximal rate does not occur in the early part of the first year. This would suggest that the thrombosis-prone state observed after a thrombotic episode does not obtain in the same degree after a discontinuance of therapy. On the contrary, the rate is higher in the second year than it was in the first.

The subdivision of the discontinued group into those with brief, intermediate, and longer initial periods of treatment does not reveal a tendency for longer initial treatment to lead to a lower subsequent recurrence rate. Although the groups are small, the rates observed are high and rather similar after all three durations of initial treatment. The provisional conclusion would have to be that discontinuance at any time exposes the patient to an increased risk of having another thrombotic episode.

In the first year on therapy, although there were seven non-fatal recurrences, only one patient died. In the first year after discontinuing therapy, there were six deaths and only five non-fatal recurrences. The small ratio of deaths to non-fatal recurrences in the first year on treatment suggests that treatment may reduce the severity of recurrences.

A recent study by Robinson et al[6] has made available an excellent external control against which to judge the present data. The Robinson group, using the life table method of Hill, have provided survival data on a large group of patients after a cerebral thrombosis over a ten-year period. The general composition of their group appears to be sufficiently similar to justify comparison. In studying 535 survivors on whom adequate information was available, they state that an analysis of cumulative recurrences revealed that one-third had recurrences within one year, over one-half had recurrences within two years, and two-thirds had recurrences by the end of four years. The arrest of the tendency to recurrence by anticoagulant therapy as shown in Table V is very impressive in the light of these figures. Since none of our patients had resumptions of therapy in the absence of non-fatal recurrence, it is interesting to note that the recurrence rate after discontinuing therapy is similar to the results in the Robinson study except that the percentage of recurrences in the first year after discontinuing therapy is smaller than would have been expected. This finding suggests that discontinuance of therapy does not, *per se*, predispose patients to a greater likelihood of recurrent thrombosis.

The mortality in the Robinson study reveals that of every 1,000 cases, there would have been about 820 survivors at one year, about 710 at two years, and about 590 at three years. The present study shows the comparable figures for the patients on continuous therapy to be 957, 889, and 752 respectively. The group who discontinued therapy would have had 836, 740, and 667 respectively. These later figures are fairly similar to the Robinson results. It is suggested that some resumptions of therapy after non-fatal recurrences may have benefitted the survival figures in the present discontinued group.

Conclusion

Observations on a group of persons with cerebral thrombosis over several years in private practice would seem to substantiate the value of anticoagulant therapy in preventing subsequent thromboembolic episodes. The data have been brought into the form of survivorship tables for easy comparability of the results at successive dates after the initial episode.

The mortality data, particularly when compared with the results of the Robinson study, suggest a marked reduction in the death rate, particularly in the first and second year after the cerebral episode.

The recurrence rates upon discontinuing therapy after different durations of initial therapy suggest that there is no time when it becomes safe to discontinue anticoagulant therapy. The results suggest that as long as the patient's best interest would be served by avoiding further recurrences, it is probably wise to continue with anticoagulants.

The treatment did not present great problems. Only one major complication was encountered. Despite the fact that many patients had severe hypertension, no instances of intracranial bleeding were encountered.

References

1. Millikan, C. H., Siebert, R.G., and Whisnant, J. P.: Anticoagulant therapy in cerebral vascular diseases. Current Status. J.A.M.A., 166:587-592 (Feb. 8) 1958.
2. McDevitt, E., Carter, S. A., Gatje, B. W., Foley, W. T., and Wright, I. S.: Use of anticoagulants in treatment of cerebral vascular disease. J.A.M.A., 166:592-597 (Feb. 8) 1958.
3. Fisher, C. M.: Use of anticoagulants in cerebral thrombosis. Neurology, 8:311 (May) 1958.
4. Wright, I. S., and Millikan, C. H.: Cerebral vascular diseases. Grune & Stratton, 1958.
5. Thomes, A. B., Scallen, R. W., and Savage, I. R.: The prophylactic value of long-term anticoagulant therapy. To be published.
6. Hill, A. Bradford: Principles of medical statistics. Ed. 6., Chap. 14, New York Oxford University Press, 1955.
7. Robinson, R. W., Cohen, W. D., Higano, N., Meyer, R., Lukowsky, G. H., McLaughlin, R. B., and Mac Gilpin, H. H.: Life-table analysis of survival after cerebral thrombosis—ten years experience. J.A.M.A., 169:1149 (March 14) 1959.

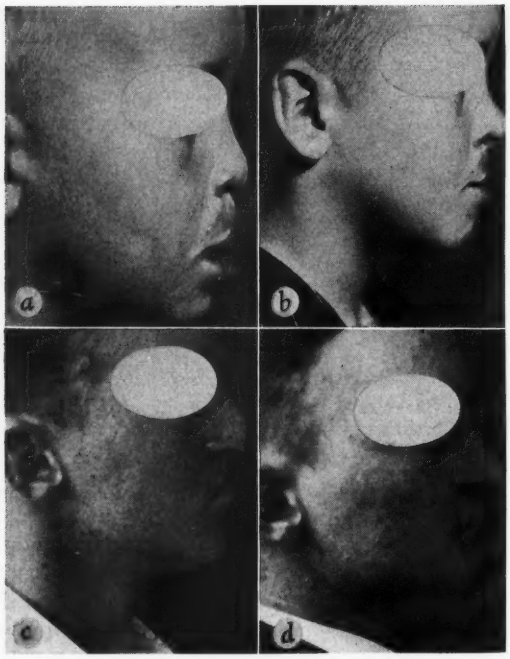


Fig. 1. (a and c) Flat nasal tips resulting from old repaired bilateral harelip. (b and d) Restoration of normal nasal contour by advancing skin from upper lip to columella as described in text.

Technique for Lengthening the Columella in Cases of Repaired Bilateral Harelip

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● *Nasal deformities remaining after satisfactory repair of harelip may loom important psychologically to the patient. This paper describes a technique for the correction of such defects.*

PRESENT-DAY surgical techniques designed to close bilateral clefts of the upper lip effect a satisfactory repair in the majority of cases. However, the child may still be burdened with a deformity of the nose, consisting of a flat nasal tip and a short columella (Fig. 1*a* and *c*). Several procedures for lengthening the columella have been described in the literature. The method selected in each individual case depends somewhat on the initial technique that was employed in the repair of the bilateral cleft. No single operation for lengthening the columella is ideal; each one has its shortcomings.

This presentation describes a technique for lengthening the columella in cases of repaired bilateral cleft of the upper lip; one of us (Erich) has used this method for several years with gratifying results. We realize that this operation is not without fault, but it has given us more satisfactory results than have been obtained by other methods (Fig. 1*b* and *d*).

The technique to be described is not entirely original with us, and it is applicable only to patients whose bilateral cleft lip has been repaired by transferring flaps from the lateral portions of the lip beneath the prolabium, denuded of its vermilion mucosa. Whether it is accomplished in one or two stages, this latter procedure is open to criticism in view of the fact that it produces an elongated upper lip in vertical dimensions. However, this increase in vertical measurements is not altogether undesirable, since it provides tissue for lengthening the columella at the time of secondary repair. The technique described in this paper cannot be used satisfactorily in patients in whom the prolabium forms the full vertical length of the middle third of the upper lip, because there is insufficient skin for advancement to the columella.

The operation to be described is better deferred until the child is four years of age or older. The preschool age of five years is a most opportune time for this type of plastic repair. General anesthesia, with use of an intratracheal airway, is recommended because it eliminates the necessity of infiltrating and distorting the tissues of the upper lip with a local anesthetic agent.

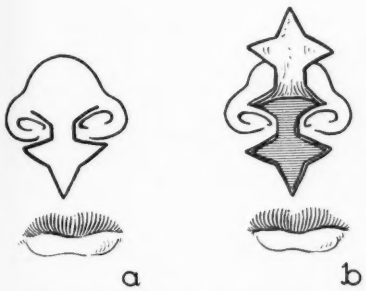


Fig. 2. *a*. Skin flap on upper lip and columella for correction of flat nasal tip due to old repaired bilateral harelip. The stellate part of the flap is outlined in the skin of the premaxilla. The lower dart should not extend to the vermilion border, and the lateral darts are so designed that the height of their bases will equal the amount of columellar lengthening desired. *b*. Entire flap is elevated and retracted upward.

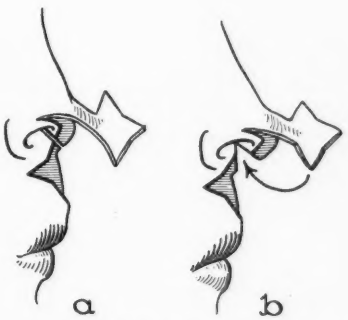


Fig. 3. *a*. Stellate flap retracted upward, exposing membranous septum. An incision is made in the membranous septum at right angles to the cut surface. *b*. Spreading apart incision leaves V-shaped defect into which lateral darts of stellate flaps will be fitted and sutured.

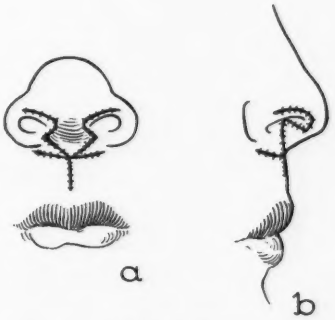


Fig. 4. *a*. Stellate flaps sutured in proper position. The resultant defect at the donor site on the upper lip has been sutured in a T-shaped fashion. *b*. Lateral view of sutured wounds, showing how lateral darts of stellate flap fit into incision in membranous septum.

Surgical Technique

The three-point stellate flap depicted in Figure 2*a* is outlined on the upper lip. The lower dart should not extend to the vermilion border, and the lateral darts should be so designed that the height of their bases will equal the amount of columellar lengthening desired. Using a sharp No. 15 Bard-Parker blade and a scissors, the flap is elevated along with a generous amount of subcutaneous tissue. Subsequently, it is extended upward to include the skin of the columella and the tip of the nose (Fig. 2*b*). Undermining the skin over the lower half of the nose permits exposure of the alar cartilages so that loose areolar tissue between their medial crura can be excised; the alar cartilages then can be approximated and sutured together with catgut, which creates a nasal tip of more normal proportions.

By retracting the stellate flap of skin on the upper lip and columella upward, the cut edge of the membranous septum is exposed (Figs. 2*b* and 3*a*). An incision is made into the membranous septum at right angles to its cut surface; opening up this small incision leaves a V-shaped defect (Fig. 3) into which the lateral darts of the stellate flap are fitted (Figs. 3*b* and 4*b*). Extremely fine silk (5/0 or 6/0) on an atraumatic needle should be employed to suture the flap in proper position. The defect at the donor site on the upper lip is next approximated and sutured (Fig. 4). Closure of the wound as outlined not only lengthens the columella but also reduces the vertical dimensions of the upper lip a trifle. Shortening the upper lip is most desirable, because it had been made abnormally long at the time of primary closure of the cleft.

Summary

A technique for lengthening the columella in cases of repaired bilateral cleft lip has been presented. This method is useful only in those cases in which the lip has been repaired initially by advancing lateral flaps below the prolabium; the technique is not adaptable to cases in which the cleft-lip defect has been closed in such a way that the prolabium forms the entire vertical length of the midportion of the upper lip. By following the steps in the surgical procedure as described, the abnormal flattening of the nasal tip is corrected, the columella is lengthened and the upper lip is shortened, thus greatly improving the facial appearance of the patient.

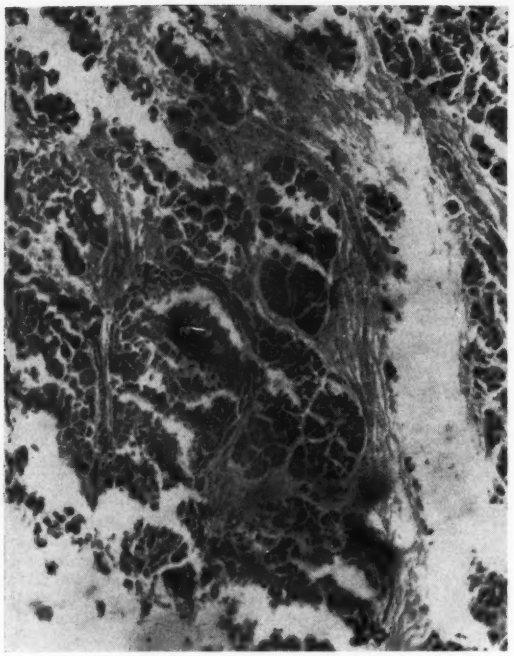


Fig. 1. Benign pancreatic tissue removed from anterior mediastinum, 1928.

Malignant Change in a

● *A benign teratoma becomes malignant after twenty-seven years.*

ONE frequently finds it stated in the literature[1-7] that a benign mediastinal teratoma is potentially malignant and, unless promptly removed, will undergo malignant change. The concept of a benign tumor's changing into a malignant one is intriguing, and we can find no documented case that demonstrates this change. Harrington[3] and Fralick and Welsman[7] reported patients who were followed preoperatively by x-ray for four and two years. It was felt that this duration indicated the tumors were at first benign and then became malignant before surgery.

We are reporting here a patient who had partial excision of a teratoma of the mediastinum which was benign on histologic study twenty-seven years before his second operation revealed malignant change in the teratoma.

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Report of Case

In 1920, at age nineteen, the patient had an incision and drainage of a swelling in his neck which led to three aspirations of brown, black and purulent fluid from the mediastinum—followed by three drainages and unroofing operations over the sternum during the next two years. A thick-walled sac was found containing multiple cavities extending from above the sternoclavicular junction downward under the sternum and laterally into the axilla. Because of infection and bone necrosis, two-thirds of the manubrium was rongeured away. Histologic examination of the excised tissues showed an occasional foreign-body giant cell.

He was first admitted to St. Mary's Hospital in Duluth in 1925 for night sweats, chest pain, cough, and blood-streaked sputum. The clinical diagnosis without bacteriologic confirmation was tuberculosis and pleurisy.

In 1928, after having a draining sinus in the sternal region for eight years the right side of his neck became swollen, tender, and painful. A section of sternum was removed by one of us (W.R.B.) to promote better drainage, and an artificial pneumothorax was induced on the

Benign Mediastinal Teratoma

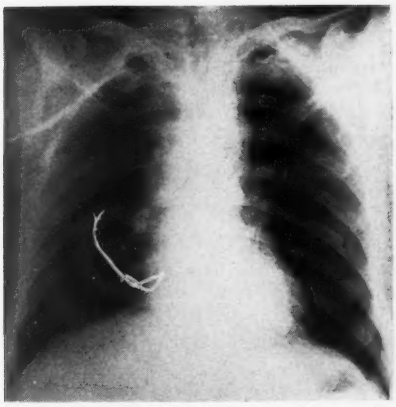


Fig. 2. Radiopaque dye injected into both cephalic veins fails to enter superior vena cava.

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right side in an effort to close a bronchial fistula. This drainage opening was revised on two occasions during the next two years, and a considerable amount of tissue was removed. Histologic examination revealed pancreatic tissue, and the final diagnosis was teratoma of the mediastinum (Fig. 1). Following this, the patient had a persistent drainage from his sternum; however, he was well and working for twenty-seven years.

He was re-admitted to the hospital on November 20, 1956, with a chief complaint of swelling of the neck. Six months prior to admission, the drainage from his sternal sinus appeared to be more purulent. Three months prior to admission, the drainage began to lessen, and eight days before coming to the hospital, he noted a swelling of the veins of the left side of his neck and a sensation of stiffening in his chest. Four days before admission, he had an attack of pleuritic pains in his chest. On physical examination there was distention in the veins on the left side of the neck and in the left upper arm, multiple scars about the anterior chest and over the sternum, and a small sinus in the upper third of the sternum from which exuded a white, watery discharge. Chest x-ray revealed a slight widening of the mediastinal shadow which did not encroach on the esophagus. Injection of contrast material into both cephalic veins in the antecubital fossa showed obstruction of both subclavian veins with no dye visualized in the superior vena cava (Fig. 2). Esophagoscopy and bronchoscopy were negative.

An incision was made through the sternum in the shape of an inverted T, and an attempt was made to reflect the sternal flaps from the mediastinal mass. As anticipated, much dense and fibrous connective tissue was encountered in the mediastinum and in attempting to reflect the sternal flaps, a laceration was made in the superior vena cava at the junction of the innominate veins. This was closed with some difficulty because the veins were enclosed in dense fibrous connective tissue; however, the blood loss was adequately replaced. A frozen section of the excised tissue was reported as undifferentiated carcinoma, and it was apparent then that the fibrosis was a desmoplastic reaction in an extensively invading, highly malignant carcinoma.

Exploratory surgery proved the condition to be hopelessly inoperable because of invasion throughout the mediastinum. Postoperatively, there was evidence of

increased vena cava obstruction, and the patient developed a cellulitis of his incision. This improved on appropriate therapy. On his eighth postoperative day, he was started on palliative deep x-ray therapy to his mediastinum—receiving a total of 300 roentgens. Following this, his condition worsened quite markedly with increased cava obstruction and increased fever. It was apparent that he had developed a thrombophlebitis of his superior vena cava with involvement of the internal jugular veins. His condition continued to deteriorate, he lapsed into coma and died on the thirteenth postoperative day.



Fig. 3. Adenocarcinoma removed from anterior mediastinum, 1956.

Autopsy revealed an extensive malignant mediastinal tumor with occlusion of the superior vena cava and a thrombosis of the right subclavian and left internal jugular veins. There were also metastases from the carcinoma to the right adrenal gland and left supraclavicular nodes.

Discussion

When Figure 1 is compared with Figure 3, it is apparent that the mediastinal teratoma, which contained benign pancreatic tissue on histologic examination in 1929, underwent a malignant change, and twenty-seven years later was an invasive adenocarcinoma. This case gives histologic confirmation to the oft-repeated statement that a teratoma of the mediastinum is potentially a malignant lesion and should be removed when the diagnosis is made. This case also illustrates the hopeless situation that is present once a malignant transformation takes place. In retrospect, it would have been better if we had attempted to make a diagnosis by more simple means, such as removing a supraclavicular node. The venous distention and swelling in the neck prevented adequate palpation in that area. Deep x-ray therapy, in view of the recent infection, was certainly ill-advised.

Summary

A case profile of a patient is presented in which a partial excision of a mediastinal teratoma was performed. Histologic examination of the tumor at that time revealed pancreatic tissue. Twenty-seven years later, this patient died following an unsuccessful attempt to remove this mediastinal tumor, and histologic examination revealed a diffusely-invasive adenocarcinoma of the mediastinum.

Acknowledgment

We wish to thank Dr. G. A. Berdez and Dr. A. C. Aufderheide for providing the histologic slides and the photomicrographs.

References

1. Blades, Brian: Mediastinal tumors. Ann. Surg., 123:749-765, 1946.
2. Curreri, A. R., Gale, J. W.: Mediastinal tumors. Arch. Surg., 58:797-818, 1949.
3. Harrington, S. W.: Intrathoracic tumors. Arch. Surg., 19:1679-1725, 1929.
4. Heuer, G. J.: Surgical treatment of tumors of the mediastinum. Ann. Surg., 113:357-363, 1941.
5. Rusby, N. C.: Dermoid cysts and teratoma of the mediastinum. Journal of Thoracic Surgery, 13:169-222 (June) 1942.
6. Schlumberger, H. G. (Capt.): Teratoma of the anterior mediastinum in the group of military age. Arch. Path., 41:398-444, 1958.
7. Fralick, F. T., and Welsman, H. L.: Mediastinal teratoma. Dis. Chest, 19:209-220 (Feb.) 1951.

Localized Brucellosis

Report of a Case with a Retroperitoneal Perisplenic Abscess

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Fig. 2. Roentgenographic appearance of the splenic and hepatic calcification.

● *On rare occasions, brucellosis can give rise to localized visceral suppuration. After ten years of intermittent illness, laparotomy in this patient disclosed a perisplenic abscess caused by brucellosis. Another unusual manifestation of brucellosis in this patient was the presence of calcified splenic granulomas.*

LOCALIZED brucellosis may present one of the most difficult diagnostic problems in clinical medicine. Some of the protean localized manifestations of this disease include spondylitis, meningo-encephalitis, osteomyelitis, septic arthritis, pulmonary granulomas, granulomatous lesions of the liver or spleen, lymphadenitis, pyelonephritis and soft-tissue abscesses.

Localized visceral suppurative changes seldom occur in brucellosis. The medical literature includes cases reported by Eyre and Fawcett,[1] who recorded a subdiaphragmatic and hepatic abscess, Hardy and associates,[2] who wrote of an anterior mediastinal abscess, Tilghman,[3] who is given credit for reporting an abscess of the iliac fossa, Spink and co-workers,[4] who documented a case of pericholecystic and hepatic abscesses, and Gottlieb,[5] who described a case of hepatic abscess with involvement of the abdominal wall and subdiaphragmatic regions.

We recently encountered a patient in whom the diagnosis of brucellosis was substantiated by culture and in whom a retroperitoneal perisplenic abscess was found. To our knowledge, this is the first report of a case with this specific complication.

Report of Case

A 40-year-old white man, who was employed in an Iowa meat-packing plant, came to the Mayo Clinic in August, 1958, for investigation of recurrent episodes of fever, chills and sweats of ten years' duration. In January, 1948, he had lacerated his hand at work; in the following month, he experienced an acute illness lasting about two weeks and characterized by periodic shaking chills, fever (up to 105° F.), soaking sweats and malaise. During this acute illness, he had several studies of the blood and was told he had "Malta fever." Throughout the subsequent year, periodic administration of a vaccine, whose nature was unknown to the patient, was followed by apparent improvement.

In April, 1949, enlargement of a right lower cervical

lymph node had developed. This node subsequently was excised surgically, and the pathologic study was reported as showing necrosis.

During 1950, the patient had begun to have recurrent illnesses three or four times a year; these episodes lasted three to seven days and were characterized by afternoon chilliness, fever (103° to 105° F.), sweats, myalgia, malaise and headaches. Many of the attacks required hospitalization. As a prodrome, he would note loss of energy, which would slowly improve after each attack over a period of two or three weeks. A temporary loss of 10 to 15 pounds usually accompanied each episode despite a continued good appetite. The presence of splenomegaly had been suspected during this period. Between attacks he felt well and worked with zeal.

Since 1956, these attacks had become more brief; however, one in August, 1958, was severe, requiring hospitalization. He had experienced attacks of fever several weeks prior to his visit to the clinic. On the day of his admission, he had noted fever as high as 103° F.

He had received numerous drugs since 1948, including chlortetracycline, penicillin, oxytetracycline, streptomycin, erythromycin and sulfonamides. The longest course of known antibiotic treatment had been given in 1955; it consisted of 500 mg. of oxytetracycline given orally every six hours for at least fifteen days, with 0.5 gm. of dihydrostreptomycin given parenterally three times daily for twelve of the fifteen days. Only questionable benefit had resulted from this regimen. Antibiotics had not been prescribed in the six months prior to his admission to the clinic.

Since the onset of his illness, results of many blood cultures had been negative, but the titer of brucellar agglutinins had been high on numerous occasions (Fig. 1).*

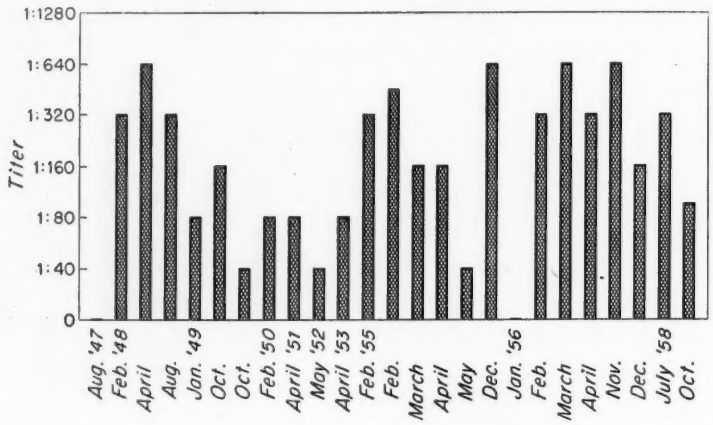


Fig. 1. Results of studies for brucellar agglutinins performed over a period of 10 years.

On admission to the clinic in August, 1958, the patient was a well-developed, healthy-appearing man who was not in any acute distress. The fever, chills and malaise noted earlier on the day of admission had disappeared. He weighed 148 pounds as compared to his usual weight of 155 pounds. His temperature was 99.4° F., and his blood pressure and pulse were within the normal ranges. No lymphadenopathy, hepatosplenomegaly or other significant findings were noted.

Erythrocyte, leukocyte and differential counts were all within normal limits. Study of a blood smear showed normal cellular morphology. Urinalysis likewise gave normal results except for a few granular casts and grade 1 pyuria. The erythrocytic sedimentation rate during the first hour was 32 mm. (Westergren method).

Brucellar agglutinins were present in a titer of 1:100. Three cultures of the blood, as well as one of the urine, failed to give any growth of brucellar organisms. A test of hepatic function showed no retention of sulfobromophthalein after one hour.

Roentgenologic studies of the stomach, gallbladder, thorax and kidneys gave normal results. Roentgenograms of the paranasal sinuses were interpreted as showing thickening of the mucous membrane of the left antrum. Roentgenograms of the abdomen and the lumbar portion of the spinal column showed multiple calcific densities in the splenic region and one in the hepatic zone (Fig. 2).

The patient remained asymptomatic and afebrile, although specific treatment was not given. On the basis of the history and the calcific densities, the diagnosis was considered to be localized brucellosis. He was advised to have abdominal surgical exploration to establish a definite diagnosis, as well as possibly to allow removal of a localized lesion.

Laparotomy in October, 1958, disclosed that the liver and spleen contained many firm nodules about 1 cm. in diameter. The spleen was fixed, being especially adherent to the diaphragm and the posterior parietal peritoneum. When the spleen was freed, a retroperitoneal abscess

*Information was kindly supplied by Drs. J. J. Weyer and Matt G. Sanders, Fort Dodge, Iowa, and Drs. I. H. Books and S. L. Hendricks, of the Iowa State Department of Health, Iowa City, Iowa.

was found that contained about 50 ml. of pus. Splenectomy was accomplished, and the abscess was evacuated. A single lesion was removed from the liver for histologic and bacteriologic examination.

patient was given 750 mg. of tetracycline orally every six hours and 0.5 gm. of equal parts of streptomycin and dihydrostreptomycin (distrycin) parenterally twice daily, starting on the third postoperative day. The objective was four weeks of treatment. He was dismissed two weeks after the operation, having experienced no difficulty except some mild persistent blood-tinged drainage from the surgical wound.

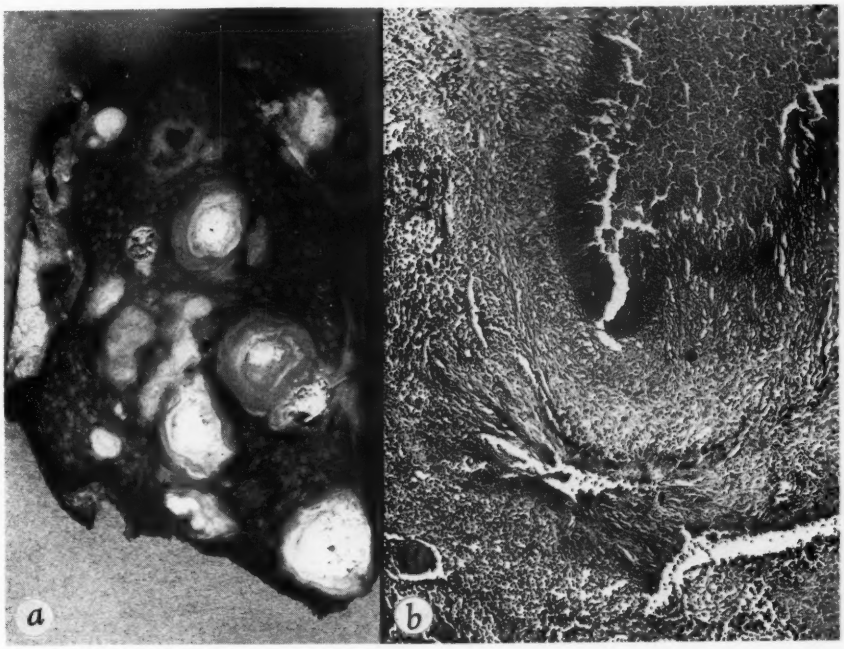


Fig. 3. Splenic brucellosis. (a) Cut surface. (b) Granuloma with necrosis (hematoxylin and eosin; x60).

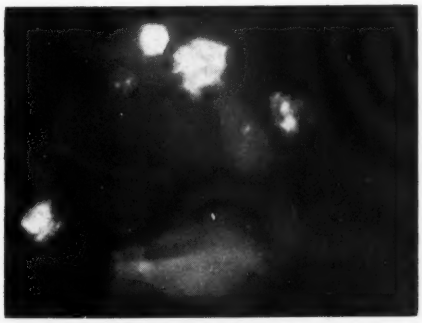


Fig. 4. Roentgenogram of a cross section of the removed spleen, showing small radiating spurs from several nodules.

Pathologic Aspects.—The spleen weighed 233 gm. and contained multiple caseous and calcified granulomas (Fig. 3). These lesions varied from 0.5 to 2.5 cm. in diameter. The specimen from the liver consisted of a solitary, calcified, laminated, caseous granuloma 1.5 cm. in diameter. Cultures of the splenic and hepatic granulomas revealed Brucella suis.

Postoperative Clinical Course.—In view of the surgical findings and the positive results of culture, the

After several days at home, he stopped taking tetracycline because of nausea and upper abdominal distress. He had received these medicaments for a total of two weeks. His personal physician then substituted 500 mg. of novobiocin given orally four times daily; this treatment was continued for two more weeks. The patient was readmitted to our care nineteen days after his previous dismissal because his home physician had obtained both brucellar organisms and staphylococci from the incisional drainage.

After readmission, culture of the drainage from the wound revealed *Staphylococcus aureus* but no brucellar organisms. The drainage tract subsequently was explored surgically, but a recurrent abscess was not found. He was treated further with kanamycin and subsequently had a satisfactory recovery, being dismissed from the hospital early in December, 1958.

Transient drainage from the most recent operative incision occurred for several weeks after his return home, but this subsided without further chemotherapy. He was gaining strength and had no further complications at the time of his last examination, five months after operation.

Comment

The calcific densities noted roentgenologically within the liver and spleen were a significant and interesting finding. Spink,[6] as well as others, pointed out that most patients with brucellosis at some time during their disease have inflammatory lesions in the hepatic parenchyma consisting of focal zones of cellular infiltration. Some of these lesions progress to necrosis or to the formation of granulomas. Splenic enlargement, increased size of the malpighian bodies, infiltration with lymphocytes, the late formation of tuberclelike lesions and other changes may be seen with acute brucellosis.[7] Culture of organisms from splenic tissue in the infected experimental animal has been used as a method of testing the efficacy of new antibiotics. The presence of large granulomas or their calcification within the spleen, however, has seldom been noted clinically.

Recently, three case reports of splenic granulomas, two with calcification, in patients with brucellosis have appeared in the literature.[8-10] Nothing of specific diagnostic value was observed on pathologic examination of the lesions in these cases. In the report of Castleman and Towne,[8] roentgenologic studies revealed large calcific splenic lesions 2 to 3 cm. in diameter showing an irregular outline, with threads of calcium spreading peripherally from a dense nodular center. This calcific pattern is extremely unusual. A roentgenogram of the pathologic specimen in our case showed somewhat more circumscribed nodules, but a number of short spicules were seen projecting from the edge in some lesions (Fig. 4). This characteristic was not prominent in the abdominal roentgenogram (Fig. 2). Other causes of splenic calcification include tuberculosis, histoplasmosis, infarction, hydatid cyst, hematomas and phlebothrombosis.[11]

The recovery of Brucella suis as the etiologic agent in our case confirmed the long-standing clinical impression regarding the cause of the patient's recurrent illnesses. This is the organism most commonly found in association with localized brucellosis.

The patient's relatively low erythrocytic sedimentation rate points out the observation of Spink and associates[4] that brucellosis must be considered when a patient with a chronic febrile illness of doubtful cause has this finding. Our case again emphasizes the observations of Weed and coworkers[12] concerning the important diagnostic value of bacteriologic study of surgically removed granulomas. In this instance, localized brucellosis was associated with systemic manifestations that had been present intermittently for ten years.

Summary

A case of localized brucellosis in a 40-year-old meat packer suffering from recurrent episodes of fever over a ten-year period is presented. Antibiotic therapy during the illness had not been helpful. Variable titers of brucellar agglutinins had been noted, but numerous efforts to culture organisms were unsuccessful until tissue from granulomas in the spleen and liver demonstrated the presence of Brucella suis. Splenectomy and drainage of a perisplenic abscess were followed by antibiotic therapy. The presence of large calcified granulomas within the spleen and a retroperitoneal perisplenic abscess constitutes the unusual manifestations of this patient's disease. Further examination five months after operation revealed satisfactory progress.

References

1. Eyre, J. W. H., and Fawcett, J.: A case of subdiaphragmatic and hepatic abscess consecutive to Mediterranean fever. Guy's Hosp. Rep., 59:207-216, 1904.
2. Hardy, A. V., Jordan, C. F., Borts, I. H., and Hardy, Grace C.: Undulant fever: With special reference to a study of brucella infection in Iowa. U. S. Nat. Inst. Health Bull., 158:1-89 (Dec.) 1930.
3. Tilghman: Quoted by Harris, H. J.[7]
4. Spink, W. W., Hall, W. H., and Aagaard, G. N.: Chronic brucellosis. Staff Meet., Univ. Minnesota Hosp. Bull., 17:194-211 (Feb.) 1946.
5. Gottlieb, J. S.: Undulant fever: An usual [sic] case with necropsy. New England J. Med., 215:781-783 (Oct.) 1936.
6. Spink, W. W.: The Nature of Brucellosis. Minneapolis: University of Minnesota Press, 1956.
7. Harris, H. J.: Brucellosis: (Undulant Fever) Clinical and subclinical. New York: Paul B. Hoeber, Inc., 1941.
8. Castleman, Benjamin, and Towne, Virginia W. (Ed.): Case records of the Massachusetts General Hospital. Case 42461. New England J. Med., 255:958-962 (Nov.) 1956.
9. Osmundson, P. J., Martin, W. J., Merritt, W. A., and Stroebel, C. F.: Brucellosis: Report of an unusual case. Proc. Staff Meet. Mayo Clin., 32:58-64 (Feb.) 1957.
10. Schirger, Alexander, Dearing, W. H., and Waugh, J. M.: Intermittent fever over a 17-year period in a patient with hypersplenism due to brucellosis. Proc. Staff Meet. Mayo Clin., 34:262-264 (May) 1959.
11. Bachman, A. L.: Calcifications in the splenic region. Am. J. Roentgenol., 41:931-949 (June) 1939.
12. Weed, L. A., Dahlin, D. C., Pugh, D. G., and Ivins, J. C.: Brucella in tissues removed at surgery. Am. J. Clin. Path., 22:10-21 (Jan.) 1952.

Lower Esophageal Ring

A Case Report

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Fig. 1. Preoperative roentgenogram in patient, L. M. At surgery the orifice was 3 mm. in diameter. The tip of a nasogastric tube could be felt through the ring by the examining finger inserted into the lower esophagus via a gastrotomy. A hiatal hernia is present.

● *The differentiation of functional dysphagia with some types of organic conditions involving the lower esophagus may be quite difficult. This report of the relatively recently described "lower esophageal ring" illustrates the problems involved. Whether this is a specific entity or merely one of the complications of esophageal hiatal hernia remains to be seen.*

ASYMPTOMATIC, localized areas of constriction of the distal third of the esophagus have been described as an incidental fluoroscopic or radiologic finding.[1] The case reports of Ingelfinger and Kramer[2] and Schatzki and Gary[3,4] in 1953 first illustrated that such constrictions, of a marked degree, could produce symptoms of dysphagia. Though the etiology and the gross and microscopic pathologic anatomy of such constriction rings are poorly understood, the clinical and roentgenologic picture in symptomatic patients is so typical that Schatzki and Gary believe it is a distinct clinical entity which they call "the lower esophageal ring." The following is a case report and a review of the literature concerning the characteristics of this entity and its treatment.

Report of Case

Case L. M. (A-237170).—This sixty-year-old white man was admitted to Ancker Hospital on April 25, 1959 with symptoms of intermittent dysphagia present since September 1957. The dysphagia was a substernal discomfort brought on by ingesting a large bolus of food. Though the symptoms had not been progressive and the patient had maintained his normal weight, he had to restrict his diet to liquids and strained baby food. An upper gastrointestinal roentgen examination demonstrated a localized web-like narrowing of the distal esophagus which partially obstructed the flow of barium (Fig. 1). This deformity was persistent and was observed in all views of the lower esophagus. A small sliding-type

hiatus hernia was also noted. Gastric analysis was performed. Though the tube probably did not enter the stomach, 45 cc. of gastric fluid was recovered and over 100 degrees of free acid was present. Esophagoscopy was refused.



Fig. 2. Postoperative roentgenogram. The hiatal hernia has been repaired and only a slight deformity remains at the site of the lower esophageal ring.

Past History.—A tissue diagnosis of prostatic carcinoma was established following a transurethral resection of the prostate gland in 1956. Since then the patient has been on stilbesterol, 5 mg. daily, and has been without clinical or roentgenological evidence of metastases.

Clinical Course.—Because of the unrelenting nature of the dysphagia, an operation was undertaken on May 22, 1959. An upper abdominal, midline incision was used. There was a small sliding hiatal hernia present. The esophagus was mobilized for a short distance. A gastrotomy was made in the anterior aspect of the fundus of the stomach. Through this an examining finger was passed into the esophagus. Immediately above the esophago-gastric junction a thin, web-like membrane could be felt occluding the esophagus. The occlusion was almost complete, except for an aperature approximately 3 mm. in diameter. With some difficulty the web was ruptured by the examining finger, and the esophageal lumen at this site enlarged to near normal size. The mucosa at the site of constriction was visualized and appeared perfectly normal. The gastrotomy was closed, the hiatus hernia repaired, and a Heineke-Mikulicz pyloroplasty performed. Postoperatively, the patient's recovery was rapid and uneventful. The patient has remained asymptomatic and capable of eating all foods. X-ray studies demonstrate only a slight degree of narrowing at the site of the previous web (Fig. 2).

Comment

It is felt that the above case illustrates many of the typical findings of the symptomatic lower esophageal ring as described in earlier papers.[2-4] Typically, the onset of symptoms occurs after the fifth decade. Men and women are affected with equal frequency. Intermittent dysphagia is the characteristic complaint and may have been present for periods ranging from a few months to several years. The dysphagia is a severe substernal distress produced by ingesting a bolus too large to pass the constriction ring and, characteristically, meat and bread are common offenders. Long, symptom-free intervals may and often do occur as the patient learns to masticate carefully all foods and to avoid those which precipitate difficulty. When this type of regimen is not strictly adhered to, symptoms recur. This would seem to explain the more frequent occurrence of symptoms during periods of emotional stress or tension when the individual may not be so precise about his eating habits. The distress is relieved by passage of the bolus or its regurgitation. If neither occurs, the discomfort may be protracted for hours. Liquids do not produce the dysphagia, but may aid the passage of an obstructing bolus and thereby contribute to the relief of symptoms. More often, liquids will increase the severity of the symptoms if taken after their onset. In spite of severe dysphagia most patients manage to maintain their weight with dietary modifications. In some reported cases the symptoms have progressed but in the majority they have remained relatively constant.

Esophagoscopy usually is negative. The esophageal mucosa appears normal and in only a few instances have the rings been actually visualized.

The roentgenologic characteristics of this lesion have been carefully described by Schatzki and Gary.[3,4] At its distal end the esophagus is seen to be constricted by a localized, smooth, web or diaphragm-like, symmetrical narrowing. This narrowing is usually located 4 to 5.5 cm. above the

(Turn to Page 1607)

(Continued from Page 1602)

diaphragm and forms a sharp right angle with the esophageal wall. The ring averages 2 to 4 mm. in thickness. Sliding hiatus hernias have been demonstrated in almost all reported cases. Fluoroscopically, these rings are difficult to demonstrate unless the esophagus above and below is dilated to a greater diameter than that of the constriction. When these lesions are missed, the patients are frequently labeled as neurotics. Symptoms are directly related to the diameter of the narrowed esophageal lumen as measured on spot films, disregarding the enlargement produced by divergent beams. These narrowings may vary from 3 mm. to 38 mm. in diameter. Patients with large diameter constrictions are usually asymptomatic; those with esophageal rings of 13 mm. in diameter or less are uniformly symptomatic.

The rings act as an area of decreased distensibility. Fluoroscopically, a barium-filled capsule or a food bolus of proper size may be seen to dilate the constriction a few millimeters but no more. A bolus of larger size will be delayed in its passage and thus produce symptoms. The diameter of the ring remains quite constant in most patients. It is striking that even in patients with marked dysphagia and with very narrow rings no dilation of the proximal esophagus is seen.

Associated lesions, other than the aforementioned sliding esophageal hiatus hernias, are not uncommonly encountered. Duodenal ulcer is frequently noted, but in a series of twenty-two cases, three Zenker's diverticula were found also.[4] The significance of these associated lesions, if any, is not clear.

The above features are almost always sufficiently characteristic to distinguish the lower esophageal ring from the longer, irregular, asymmetric constrictions seen with cancer. In achalasia, the area of spastic narrowing is in the most distal esophagus, it is not web-like, and the proximal esophagus is dilated. Peptic esophagitis or chemical, erosive esophagitis produces a cone-shaped narrowing with ulcerations occasionally.

Though the roentgenologic anatomy seems clear-cut, the etiology and pathologic anatomy of this lesion is still unclear. Ingelfinger and Kramer biopsied one ring which demonstrated muscular hypertrophy.[2] Others report a chronic inflammatory cell infiltrate in the submucosa as the only abnormality.[5] Bartlett and Jones feel that these rings consist of esophageal mucosa on the superior surface and gastric mucosa on the inferior surface.[6] They note a chronic inflammatory cell infiltrate in the submucosa between these layers. This finding was present in only one of their patients. A more clearly defined concept of this entity awaits further elucidation of these basic questions.

Most symptomatic patients are simply treated by educating them as to proper selection and mastication of food. For those with small apertures and those few with progressive symptoms, treatment with anti-spasmodic drugs and esophageal dilatation offers no relief, or at best only temporary relief, and surgical intervention is required. A number of procedures have been employed with good results. These include esophagoplasty, excision of the ring around its circumference, excision of segments of the ring, and complete removal of the involved portion of the esophagus with esophageal repair. The most direct procedure, and the one employed in the case reported in this paper, is that described by Bartlett and Jones.[6] It consists merely of performing a gastrotomy through the anterior surface of the gastric fundus and rupturing the ring with the examining finger which is inserted through the gastrotomy up into the esophagus. The gastrotomy is closed and the accompanying hiatus hernia is then repaired.

Summary

A case with a symptomatic lower esophageal ring successfully treated surgically is reported, and the literature concerning the clinical and roentgenologic aspects, as well as treatment, is reviewed. Though the etiology and the pathologic anatomy are poorly understood, the clinical and roentgenologic characteristics of reported cases are strikingly consistent.

References

1. Templeton, F. E.: X-ray Examination of the Stomach. P. 112, Chicago: University of Chicago Press, Illinois, 1944.
2. Ingelfinger, F. J., and Kramer, P.: Dysphagia produced by a contractile ring in the lower esophagus. Gastroenterology, 23:419, 1953.
3. Schatzki, R., and Gary, J. E.: Dysphagia due to a diaphragm-like localized narrowing in the lower esophagus ("lower esophageal ring"). Am. J. Roentgenol., 70:911, 1953.
4. Schatzki, R., and Gary, J. E.: The lower esophageal ring. Am. J. Roentgenol., 75:246, 1956.
5. Bugden, W. F., and Delmonico, J. E.: Lower esophageal web. J. Thoracic Surg., 3:1, 1956.
6. Bartlett, M. K., and Jones, C. M.: Surgical experience with the lower esophageal ring. Ann. Surg., 149:491, 1959.

Massive
Upper Gastrointestinal Hemorrhage in Pregnancy

Read at the meeting of the Minnesota Obstetrical and Gynecological Society, Duluth, Minnesota, April 25, 1959.

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THE interesting problems encountered in the recent management of a patient who had massive hemorrhage from the upper part of the gastrointestinal tract complicating pregnancy prompted a search through the files of the Mayo Clinic for other similar cases. Records of the estimated 20,000 pregnancies (not pregnant women) encountered at the clinic from 1945 through 1957 were cross-indexed against possible causes of upper gastrointestinal hemorrhage. Although a sizable group of pregnant patients experienced minimal hematemesis or melena, six patients with massive hemorrhage were discovered, one of whom has been reported on previously by Bowers and Walters.[1] It is the purpose of this paper to review these six cases, directing particular attention to the diverse sources of the bleeding and the alarmingly poor fetal survival.

TABLE I. CAUSE AND FETAL SURVIVAL IN SIX CASES OF MASSIVE UPPER GASTROINTESTINAL HEMORRHAGE ASSOCIATED WITH PREGNANCY

Case	Diagnosis	Fetal Outcome
1	Carcinoma stomach, postgastrectomy bleeding	Stillbirth, 28 weeks
2	Hiatus hernia and pre-eclampsia	Stillbirth, 36 weeks
3	Bleeding gastric artery, no gross ulceration	Stillbirth, 32 weeks
4	Hiatus hernia	Viable, term
5	Esophageal varices	Viable, term
6	Duodenal ulcer	Viable, term

General Background

It is difficult to determine the exact incidence of peptic ulcer in pregnant women, since most peptic ulcers are ameliorated by pregnancy.[2,3] Although it has been estimated[4] that the incidence of peptic ulcer in women of childbearing age is approximately 2 per cent, the incidence in pregnant women is considerably less; indeed, reports indicate that proved active peptic ulcers in pregnant women are rare.[2,5,6]

Aggravation of peptic ulcer in pregnancy does occur and may cause death on rare occasions. Durst and Klieger,[4] in 1955, reported the eighteenth fatal case of peptic ulcer in pregnancy confirmed by necropsy. Vasicka and co-workers,[7] in their recent review of the literature on peptic ulcer in pregnancy, stated that when aggravation or perforation of, or hemorrhage from a peptic ulcer does occur, it is commonly in the last trimester, during labor, or immediately post partum.

Hiatus hernia is thought to appear more fre-

quently in pregnant women than it does in the general population. The general incidence has been reported to range from approximately 1[8] to 9 per cent.[9] However, the reported incidence in unselected series of pregnant women varies from approximately 13[10] to 22 per cent.[11] Little information is to be found on the incidence of hematemesis from this condition in pregnancy, most of the literature being in the form of case reports. Sutherland and co-workers[11] reported four cases of hematemesis, in three of which hospitalization was required, giving an incidence of 20 per cent in their cases of hiatus hernia associated with pregnancy. Harrington[12] stated that hemorrhage is not an uncommon sign in esophageal hiatus hernia, the cause being a traumatic ulcer. He also noted that the hemorrhage may be severe enough to endanger life, while in other instances, the patient is unaware of bleeding and may have severe secondary anemia resulting from occult loss of blood.

Pregnancy associated with bleeding esophageal varices or carcinoma of the stomach must be exceedingly rare if one can judge by the infrequency with which it is mentioned in the literature.

In the infrequent case reports of massive gastrointestinal hemorrhage in pregnancy, the cause of the hemorrhage often remains unknown and the fetus often does not survive. Carangelo and Efstation[13] reported on four patients who had massive gastric hemorrhage, three of whom also had eclampsia. Three of these four women had stillborn infants, the fetal heart tones disappearing after the onset of hematemesis. The three mothers also failed to survive. The cause of the hemorrhage in all cases was obscure. Greeley and Stubenbord[14] reported a case of severe gastric hemorrhage with tarry stools and shock in which the patient recovered after being delivered of a stillborn infant. Subsequent roentgenologic studies of the gastrointestinal tract failed to show a cause for the bleeding. Both of these last two reports noted a case cited by Preiss, in 1907, in which the patient experienced hematemesis with her second and third pregnancies and delivered stillborn infants within 24 hours of the onset of severe gastrointestinal hemorrhage, melena and shock.

Others[15,16] have reported similar examples of massive hemorrhage from peptic ulcer during pregnancy, followed by delivery of stillborn infants. However, similar circumstances also may be followed by delivery of viable infants.[17]

Reports of Cases

Case 1.—A 33-year-old woman, gravida 3 and para 2, gave a history of achlorhydria and, more recently, a gastric ulcer. She recently had been hospitalized elsewhere for pain in the epigastrium and left flank and anemia, for which she had received blood. On admission in April, 1953, examination revealed an intrauterine pregnancy of 25 weeks' gestation, with fetal heart tones present. A roentgenologic diagnosis of an obstructing ulcerating pyloric lesion was made. Subtotal gastrectomy was done for what proved to be grade 4 adenocarcinoma. The postoperative course was uneventful until the sixteenth day, when massive melena and hematemesis developed. The value for hemoglobin was 8.4 gm. per 100 ml. of blood. She was given 2000 ml. of blood. The bleeding, which recurred on the nineteenth postoperative day, could not be controlled without laparotomy and the administration of an additional 4000 ml. of blood. Thereafter, the fetal heart tones disappeared. Spontaneous delivery of a macerated infant occurred eight days after the episode of massive bleeding leading to reoperation.

Case 2.—A 40-year-old woman, gravida 6 and para 4, with one abortion, for several years had noted prolonged episodes of burning epigastric distress, most severe at night and partially relieved by ingestion of water. With the onset of her present pregnancy, the pain had become steadily more severe, with extension to the substernal and lower posterior thoracic region; occasional episodes of mild hematemesis had been noted. Two weeks prior to admission in March, 1950, she had been hospitalized elsewhere because of severe pre-eclampsia. Epigastric pain, massive hematemesis and melena occurred on the day prior to admission. Examination at the clinic revealed a severe degree of pre-eclampsia and an intrauterine pregnancy of 36 weeks' gestation, with fetal heart tones present. The value for hemoglobin was 9.2 gm. She continued to vomit small amounts of blood and, despite the administration of 1000 ml. of blood, the level of hemoglobin decreased to 7.6 gm. On the third day in the hospital, the fetal heart tones were no longer audible. Subsequently, because of the toxemia, amniotomy was done, followed by delivery of a macerated infant. The gastrointestinal bleeding did not recur. Roentgenologic studies later disclosed an esophageal hiatus hernia.

Case 3.—A 20-year-old primigravid patient gave a history of being awakened twice during her pregnancy by severe "heartburn." During the 2 days prior to admission, this had recurred and persisted. She came to the clinic in September, 1958, after three episodes of hematemesis without pain or melena. Examination revealed an intrauterine pregnancy of 32 weeks' gestation, with fetal heart tones present. Her pulse was rapid, and the hemoglobin measured 9.7 gm. All factors in the blood-clotting mechanism were normal. Hematemesis continued on the day of admission, and 1000 ml. of blood was administered. On the following day, 3000 ml. of blood was given because of continuing hematemesis. Although the blood pressure was maintained at relatively normal levels and the value for hemoglobin

remained at 9.7 gm., the fetal heart tones became inaudible. Insertion of a Sengstaken tube, while it stopped the hematemesis, merely served to camouflage the persistent bleeding temporarily, until massive melena appeared. On the third day, despite continuing administration of blood, she was in borderline shock, although the blood pressure remained at an adequate level. It had been thought that she was bleeding from a peptic ulcer and that, in a person of her age, one could expect the bleeding to subside with medical management. However, it was finally apparent that this was a false assumption and that surgical intervention no longer could be delayed. Via a large gastrotomy incision, a single arterial bleeder, unaccompanied by gross surrounding ulceration, was located in the cardia and ligated. Additional blood was given, bringing the total she received to 9000 ml. The following day, a macerated infant was delivered spontaneously, the placenta being small and infarcted. Recovery was uneventful.

Case 4.—A 36-year-old woman, gravida 3 and para 2, had a lifelong history of indigestion and epigastric distress. For two months she had suffered from epigastric burning pain that extended to the back, awakened her at night and was relieved by ingestion of soda or milk. On the day of admission, in November, 1957, she experienced four episodes of massive painless hematemesis and melena. On examination, the pulse was rapid and she appeared anemic. The intrauterine pregnancy was of 38 weeks' gestation, with good fetal heart tones. The value for hemoglobin was 9.7 gm. She was given 1500 ml. of blood. Although active bleeding did not recur, the level of hemoglobin remained at 9.7 gm. on the third hospital day, and an additional 1000 ml. of blood was administered. Mild epigastric pain persisted; she was dismissed on the eighth hospital day, with instructions to follow a strict ulcer program. She subsequently delivered a viable infant and had no further gastrointestinal difficulty. Roentgenologic studies later revealed a large esophageal diaphragmatic hernia.

Case 5.—A 31-year-old woman, gravida 4 and para 3, had been known to have esophageal varices. During the past 10 years, she had experienced 12 episodes of hematemesis and melena, all but two having been associated with pregnancy. The day before admission in April, 1947, she had experienced three bouts of massive hematemesis and had received 1000 ml. of blood at another hospital. When admitted here, she appeared anemic, the value for hemoglobin being 8.2 gm. Physical stigmas suggestive of hepatic disease were absent, but splenomegaly was present. The intrauterine pregnancy was of 5 months' gestation, with fetal heart tones present. Results of liver-function tests were normal, as were the blood-clotting factors. No further evidence of active bleeding occurred. However, on the seventh hospital day, the level of hemoglobin was 5.7 gm., and she received 500 ml. of blood. Roentgenologic investigation confirmed the presence of large esophageal varices, and Banti's syndrome was considered to be the probable basis for the portal hypertension. Splenectomy was deferred. She subsequently was delivered of a viable infant at term and underwent a successful splenectomy and splenorenal venous anastomosis elsewhere.

Case 6.—A 23-year-old primigravid patient described occasional postprandial epigastric distress. For the month prior to admission in February, 1956, she had noticed epigastric pain and backache. She recently had contracted "influenza," followed by bloody diarrhea. The latter, associated with upper abdominal pain, had recurred on the previous day. On admission, she appeared extremely weak and anemic, although not in shock. The intrauterine pregnancy was of 28 weeks' gestation, with fetal heart tones present. Dark blood was present in the rectum. The value for hemoglobin was 4.8 gm. Melena continued and by the fourth day, when the bleeding gradually subsided, the patient had received 4000 ml. of blood. Proctoscopic and roentgenologic studies of the colon and small intestine gave normal results. The patient was dismissed on the fourteenth day. However, subsequent roentgenologic studies revealed a duodenal ulcer, and a routine ulcer regimen was advised. No additional bleeding occurred. The remainder of the pregnancy and the delivery elsewhere were uneventful.

Comment

Table I summarizes the diagnoses and fetal survival in these six cases. In three of the six patients, pregnancy terminated in stillbirths, all shortly after massive gastrointestinal hemorrhage. The causative factor for the fetal deaths cannot be stated with certainty. One patient (case 2), in addition to massive hemorrhage, had severe pre-eclampsia, which undoubtedly affected the fetus. In cases 1 and 3, however, there were massive hemorrhage and borderline shock. Although tolerance to anoxia is present to a greater degree in the newborn infant than it is in the adult, it appears that profound maternal anemia or shock, such as may accompany massive gastrointestinal bleeding, may produce serious effects on the fetus and result in fetal death in utero.

In the afore-mentioned group of 20,000 pregnancies studied at the clinic, a total of 30 were associated with duodenal ulcer proved roentgenologically. Only one of these patients (case 6) experienced massive hemorrhage during pregnancy. Two other patients with duodenal ulcer in this group of 30 had massive gastrointestinal bleeding shortly after delivery, one on her eighth postpartum day and one approximately two months postpartum.

A total of 13 pregnant women had proved esophageal hiatus hernias. All of these were studied, although not necessarily during pregnancy, because of gastrointestinal symptoms. Of this

group, two patients (cases 2 and 4) experienced massive gastrointestinal bleeding while pregnant.

Thus, in our small group of six cases, massive hemorrhage presumably was from hiatus hernia in two instances and from peptic ulcer in one. This correlates well with the reports in the literature, which indicate that aggravation during pregnancy appears more likely for esophageal hiatus hernia than for peptic ulcer.

Bleeding from a peptic ulcer has a tendency to be self-limiting in relatively young patients, such as those with whom we were dealing. This appears to be especially true when the ulceration is associated with a hiatus hernia. Moreover, the exact source of the bleeding is frequently not known. For these reasons, the surgeon is naturally and perhaps justifiably reluctant to operate when the source of bleeding is indeterminate, the fate of the fetus is questionable, and a large pregnant uterus is present to hinder exploration and adequate exposure for what may be a major operative procedure. That this reluctance should be overcome more rapidly in some instances is best indicated by our third patient, who was treated initially by conservative measures that included administration of 6500 ml. of blood. Further observation would have terminated in maternal death in addition to loss of the fetus.

Conservative medical management, with close observation and adequate replacement of blood, rather than immediate surgical treatment, undoubtedly is to be preferred. However, bleeding in these women should be treated even more vigorously than it is in nonpregnant persons to prevent the shock and secondary anemia that jeopardize the fetus, and undue delay should not take place once it becomes apparent that use of transfusions is inadequate treatment. In general, gastrointestinal bleeding in pregnant women should be managed the same as it is in nonpregnant patients. If more than 2000 or 2500 ml. of blood per 24 hours is required to maintain an adequate blood pressure, pulse and hemoglobin, the patient has massive hemorrhage and, in the absence of blood dyscrasia or bleeding tendencies, emergency operation is indicated.

Summary and Conclusions

A study was made of six patients who had massive hemorrhage from the upper part of the gastrointestinal tract during pregnancy. This represented the incidence of this complication in approximately 20,000 pregnancies. The source of such bleeding was diverse. This hemorrhage was most common in association with esophageal hiatus hernia.

In three of these six patients, the pregnancy terminated in a stillbirth shortly after the massive hemorrhage. There were no maternal deaths.

The fetal risk may be diminished by adequate replacement of blood to prevent maternal shock and secondary anemia and by immediate abdominal exploration when it becomes apparent that blood transfusions alone are insufficient to maintain or improve the mother's condition.

References

1. Bowers, R. N. and Walters, Waltman: Carcinoma of the stomach complicated by pregnancy: Report of an unusual case. Minnesota Med., 41:30-31 (Jan.) 1958.
2. Sandweiss, D. J., Saltzstein, H. C. and Farbman, A. A.: The relation of sex hormones to peptic ulcer. Am. J. Digest. Dis., 6:6-12, 1939.
3. Clark, D. H.: Peptic ulcer in women. Brit. M. J., 1:1254-1257 (June 6) 1953.
4. Durst, J. B. and Klieger, J. A.: A report of a fatal hemorrhage due to peptic ulcer in pregnancy. Am. J. Obst. & Gynec., 70:448-451 (Aug.) 1955.
5. Jones, F. A.: Haematemesis and melaena with special reference to bleeding peptic ulcer. Brit. M. J., 2:477-482 (Sept. 27) 1947.
6. Rider, J. A., Kirsner, J. B. and Palmer, W. L.: Active duodenal ulcer in pregnancy. Gastroenterology, 24:357-361 (July) 1953.
7. Vasicka, Alois, Lin, T. J. and Bright, R. H.: Peptic ulcer and pregnancy. Review of hormonal relationships and a report of one case of massive gastrointestinal hemorrhage. Obst. & Gynec. Surv., 12:1-13, 1957.
8. Kirklin, B. R. and Hodgson, J. R.: Roentgenologic characteristics of diaphragmatic hernia. Am. J. Roentgenol., 58:77-101 (July) 1947.
9. Brick, I. B.: Incidence of hiatus hernia and associated lesions diagnosed by roentgen ray. Arch. Surg., 58:419-427 (April) 1949.
10. Rigler, L. G. and Eneboe, J. B.: The incidence of hiatus hernia in pregnant women and its significance. J. Thoracic Surg., 4:262-268 (Feb.) 1935.
11. Sutherland, C. G., Atkinson, J. C., Brogdon, B. G., Crow, N. E. and Brown, W. E.: Esophageal hiatus hernia in pregnancy. Obst. & Gynec., 8:261-264 (Sept.) 1956.
12. Harrington, S. W.: Various types of diaphragmatic hernia treated surgically: Report of 430 cases. Surg. Gynec. & Obst., 86:735-755 (June) 1948.
13. Carangelo, John and Efstation, T. D.: Massive gastric hemorrhage in pregnancy. Am. J. Obst. & Gynec., 56:191-194 (July) 1948.
14. Greeley, A. V. and Stubenbord, W. D.: Pregnancy complicated by severe gastric hemorrhage. Am J. Obst. & Gynec., 42:154-156 (July) 1941.
15. LeWinn, E. B.: Peptic ulcer with hemorrhage during pregnancy and fetal death. Am. J. Obst. & Gynec., 54:114-118 (July) 1947.
16. Johnston, J. L.: Peptic ulcer and pregnancy: Deaths from perforation and hemorrhage of peptic ulcer during pregnancy. Obst. & Gynec., 2:290-296 (Sept.) 1953.
17. Bernstine, J. B. and Friedman, M. H. F.: Peptic ulcer in pregnancy. Am. J. Obst. & Gynec., 56:973-976 (Nov.) 1948.

Primary Carcinoma of the Fallopian Tube

Case Report

Papanicolaou smears offer a useful method in the diagnosis of the rare primary carcinoma of the Fallopian tube.

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PRIMARY carcinoma of the Fallopian tube is one of the most malignant and one of the rarest tumors of the female genital tract. The lesion is very rarely diagnosed preoperatively and has a poor five-year survival rate. Such a tumor should be studied as completely as possible.

Renaud[1] in 1847 recorded the first primary carcinoma of the tube. Not until 1888 did Orthmann[2] give the first complete description of the lesion. Barth and Sanger,[3] in 1895, gave the first detailed description and classification which has remained classical today.

Incidence

To date, there are still less than 550 cases reported. Undoubtedly more would have been recorded if the tumors were reported correctly and not mistaken for uterine or ovarian cancer or confused with other pelvic pathology, for example, tuberculosis. Wharton and Krock[4] in 1929 found only five cases of primary carcinoma of the Fallopian tube in 35,000 gynecologic admissions to the Johns Hopkins Hospital. Finn and Javert[5] in 1949 reported six cases in 20,617 gynecologic patients in the Women's Clinic of the New York Hospital, an incidence of one in 4,000. Hu, Taymor, and Hertig[6] in 1959 noted twelve primary carcinomas of the tube in 3,878 primary malignant cases of the female generative tract in 90,611 admissions at the State Hospital for Women, for an incidence of 0.31 per cent of primary malignant tumors at this hospital. Lofgren and Dockerty[7] in a report of sixteen cases had an incidence of 0.16 per cent.

Age Incidence

The average age, according to Wechsler[8] is approximately forty-five years. Lofgren and Dockerty found the age to be 50.9 years with extremes of thirty-four and sixty-five. Hu and associates quoted three cases in the literature at the age of eighteen. Fullerton's[9] oldest patient was eighty

years of age. In regard to parity, in reviewing the literature the impression is that this lesion has been observed just as frequently in nulliparous as in parous women and there has appeared to be no correlation between marital status and family or menstrual history in tumor incidence. Sterility is associated with primary carcinoma of the Fallopian tube and was found in 29 per cent of Hu's series and 44 per cent of Sanger and Barth's, 32 per cent of Curtis's[10] and 30 per cent of Frankel's.[11] Lofgren and Dockerty found nearly 100 per cent incidence of sub-acute chronic inflammatory cases in the portions of the tubes not involved by carcinoma.

Diagnosis

In reviewing the literature, it was found that preoperative diagnosis was seldom made. The symptoms and signs are so protean that this condition is often confused with other common pelvic pathologic entities. A common triad of symptoms is: (1) vaginal discharge, while usually bloody, may be scanty or profuse and either clear fluid or serosanguineous in character, (2) abdominal pain, usually on the affected side, which may be crampy, or sharp to lancinating in character, (3) palpable adnexal mass. The syndrome of abdominal pain that is relieved by or disappears with the concomitant onset of a heavy vaginal flow and sometimes with the disappearance of a pelvic mass has been described as *hydrops tubal profluens*. This condition is rarely observed and is not due to carcinoma, but to the sealing off of the tube in the presence of secretions from the tubal epithelium. Mitchell and Moller[12] quote Hobbs, "In a serous or serosanguineous discharge from the cervix there are to be considered: (1) carcinoma of the uterus, (2) hydrops tubal profluens, and (3) primary carcinoma of the Fallopian tube. In fact, Martztoff[13] considered the serosanguineous discharge, alone, to be pathognomonic of the condition, providing the uterus and vagina are normal.

Brewer and Guderian[14] emphasize the value of the cyto-smear in the detection of carcinoma of the tube in the report of three cases. Others, namely Fidler and Lock,[15] MacLean[16] and Corscaden,[17] and Frankel and Papanicolaou[18] have reported cases of carcinoma of the tube with positive smears. Since the vaginal smear can reflect changes anywhere in the upper genital tract, a positive smear should lead to suspicion of carcinoma of the tube or ovary whenever dilatation and curettage, and cervical biopsies fail to disclose malignancy. Vaginal cytologic studies unquestionably offer the best possibility for preoperative diagnosis of tubal carcinoma.

Brewer suggests culdoscopy or uterosalpingography unless symptoms or findings are present justifying exploratory laparotomy. It is suggested that one lean toward laparatomy in climacteric and post-menopausal women in whom child-bearing functions are not under consideration. Even at the operating table, the correct diagnosis is very difficult since the gross appearance of the affected tube is seldom distinctive. Transection of the removed tube at the time of surgery will permit a correct diagnosis to be made in most instances. In Tatum and Golden's[19] series of seventeen patients, none was diagnosed preoperatively and only three at the time of surgery.

Pathology

Pathologic diagnostic criteria for the establishment of the diagnosis of primary tubal malignancy are: (1) Grossly, the main tumor is in the tube; (2) microscopically:—chiefly, the mucosa should be involved and should show a papillary pattern and (3) if the tubal wall is found to be involved to a great extent, the transition from benign and malignant epithelium should be demonstrable.

Gross Pathology

In advanced cases the gross appearance is quite characteristic. The tube is sausage-shaped, tremendously enlarged, and is simlar to a huge pyosalpinx, except that it lacks the familiar adhesions. The serosal surface is quite smooth while the abdominal orifice of the tube may be either closed or patent. The disease usually arises in the middle or outer third of the tube. When the disease is found in an earlier stage, only a localized nodular enlargement at the involved area may be noted, although there may be dilatation of the tube proximal to this because of the retention of exudate which is often serosanguineous or bloody.

On cross section, the lumen is found to be full of a grayish, granular party-necrotic mass divided by fine septum of connective tissue. In the smaller growths, a vegetative excrescence may be seen in only one segment of the cut lumen. The tubal wall can vary in thickness being normal at times—even in the presence of large growths. Most frequently,

the wall is very thin and often small metastatic growths are present on its external surface.

Microscopic Pathology

The varieties of microscopic classification are numerous. The differences undoubtedly arise from the fact that the group pattern may result in two different forms (papillary and papillary alveolar) with the various gradation or combinations of the two. The most widely accepted classification is that of Sanger and Barth:

Grade I papillary carcinoma: The tumor is confined to the lumen and the transition between normal and malignant tissue is clearly seen. The tumor is well differentiated and the mitosis are infrequent.

Grade II papillary alveolar carcinoma: The tumor shows early glandular formation and there is early invasion of the tubal wall. The individual cells are undifferentiated and there are a moderate number of mitosis.

Grade III alveolar-medullary carcinoma: The tumor shows no papillary projections and the cells are arranged in a medullary or glandular pattern. The cells are poorly differentiated and there is early invasion of lymphatic vessels in the tubal wall. Arthur Hertig, in disagreement with the majority of the writers, found a relatively good correlation between histologic grading and survival of the patient. In Grade III (the most malignant) there were none living—the longest period of survival being twenty-seven months in that group.

Treatment and Prognosis

From reports in the literature, it appears that the surgeon of today is operating on carcinoma of the Fallopian tube earlier and more radically with more favorable results. Hu and his associates report the highest cure rate (40 per cent in a total of twelve cases). Seven patients were treated by supra-vaginal hysterectomy and bilateral salpingo-oöphorectomy, three of whom had postoperative x-rays. One patient deemed inoperable had only a supra-vaginal hysterectomy and some radiation. The remaining four patients were treated with complete hysterectomy and bilateral salpingo-oöphorectomy. All but one had postoperative x-rays. The figures from some other sources are not nearly so favorable. Frankel reported 10 per cent for five-year survival, Lofgren and Dockerty, 16 per cent. Wechsler collected 200 cases in which only six patients survived more than three years. Haupt[20] reviewed 321 cases in 1933 with only six surviving eight years. In a most recent series of seventeen cases, Tatum and Golden presented data supporting their premise that the combination of total hysterectomy and bilateral salpingo-oöphorectomy followed by x-ray radiation offers the best prognosis for the patient with carcinoma of the tube. Six of eight of their patients were living after adequate treatment and only four of nine were alive after adequate treatment. These figures clearly suggest that early diagnosis and radical surgery will increase the cure rate.

The salvage rate can undoubtedly be improved if one follows the measures compiled from the literature:

1. Routine use of cytological smears.
2. Periodic pelvic examinations beginning in the early thirties.
3. Exploratory laparotomy in cases where there is a one-sided mass and the diagnosis is obscure.
4. After carcinoma of the cervix and fundus have been ruled out and there is a persistent uterine bleeding, exploratory laparotomy is justifiable even in the absence of a palpable mass.
5. Careful inspection and, if necessary, frozen section of the tumor at the time of surgery.
6. When diagnosis is clear, adequate surgery and deep x-ray therapy is treatment of choice.

Report of Case

The patient is a sixty-year-old white married woman who was seen in our office for the first time on January 7, 1957. At this time her presenting complaint was spotting for about three months. She stated that she had no discharge or bleeding from menopause at the age of fifty-four until the present illness. The discharge was enough to stain her clothing. There was no odor nor irritation.

Family History.—The father died at age eighty, cause unknown. The mother died at age seventy-two of a stroke. There was no significant family history and no history of accidents or injuries. Illnesses consisted of the usual childhood diseases. She had never been pregnant. There had been no evidence of any pelvic inflammatory disease. Menarche began at the age of fourteen. She had an essentially normal menstrual life. Menses occurred regularly and normally. There was no history of diseases or operations of the female organs. Systemic review was essentially non-contributory.

Pelvic Findings.—The vulva appeared normal. The vagina presented mildly atrophic changes. The cervix showed typical senile changes. Papanicolaou and cervical and vaginal smears were taken. The uterus appeared to be in third degree retroversion and normal in size. The right adnexa appeared to be negative. There was a question of enlargement of the left ovary. This was not certain because of the voluntary rigidity on the part of the patient. She was to return in one week for re-evaluation.

Laboratory Examination at Initial Visit.—Hemoglobin was 14 grams, red count and white count were normal. Sedimentation rate was 19 mm. in one hour. The urinalysis was negative. The Papanicolaou smears later were reported to be negative.

The patient was seen one week later. For the first time blood was visualized in the vagina. Because of the presence of blood, I advised the patient to have a dilatation and curettage.

On January 14, 1957, a D and C was done under general anesthesia. The findings were essentially as noted above. The cystic mass in the region of the left adnexa appeared to be approximately 3 cm. in its greatest diameter. Recto-vaginal examination at the conclusion of the procedure confirmed the vaginal findings. The pathologic report was: endocervical curettings, normal; and endometrium, atrophic. Prior to the D and C, Papanicolaou smears were repeated and reported negative for tumor cells.

The patient was discharged and told to return to the office in one month for a check-up. At this time she stated that she had had no discharge of any type for the past three weeks. She occasionally noted a toothache-like pain in the right lower abdomen. Pelvic findings were essentially unchanged and she was advised to return in two months. She did not return until four months later, at which time she complained of lower abdominal cramps and some bearing-down sensation, mostly in the midline. The uterus felt enlarged to about twice the previous size and seemed somewhat cystic and tense. The left adnexae remained the same in size. The uterus was probed and approximately 20 cc. of bloody fluid came forth. The cervix was dilated. The fluid that was removed was centrifuged. Smears were prepared for cytologic examination. These smears were reported negative for tumor cells. The patient was advised to return in two weeks.

At this time, the uterus felt about half the size it had been before. Smears were repeated and the patient was advised to return in three weeks unless symptoms returned. At her next visit, the uterus was about as it presented a month before, that is, it was distended and globular. The cervix was dilated up to a number 5 Hegar and about 40 to 50 cc. of old bloody fluid was removed. This fluid was then centrifuged and smears were made. These were reported as negative for tumor cells. Incidentally, all the smears that had been taken to this date were reviewed by at least three qualified observers.

Surgical Exploration.—The patient returned ten days later and stated that for the last three or four days she had noticed a brown vaginal discharge. The cervix was closed, but after dilatation approximately 35 cc. of red-brown fluid escaped. At this time, approximately two months after the hematometra, the patient's abdomen was explored with the preoperative diagnosis of possible carcinoma of the Fallopian tube. At surgery, examination of the pelvic contents showed a distended left Fallopian tube that appeared to contain blood. This grossly resembled a left tubal pregnancy. The end of the tube was adherent to the pelvic peritoneum of the left lateral wall. No break in the surface of the tube was seen. The left ovary was adherent to the lateral pelvic wall. The right tube and ovary were adherent to the posterior leaf of the broad ligament on the right by small filmy adhesions. They appeared normal. The uterus appeared normal. Total abdominal hysterectomy and bilateral salpingo-oöphorectomy was performed with removal of generous portions of the broad ligament. Exploration of the peritoneal cavity showed no evidence of metastasis. The hypogastric and aortic nodes were not palpably involved. The pathologist opened the specimen in the operating room. A solid grayish papillary tumor distended the left tube. A portion of this was examined by frozen section and the pathologist made the presumptive diagnosis of carcinoma of the tube.

The pathologic description of the gross specimen is as follows: The diameter of the left tube measured up to 2 cm. at its maximum point. The fimbriated end was thickened, sealed, and on opening the left tube there was a grayish-tan papillary tumor arising from the lining of the tube. The tumor measured 2.5 cm. in length, 1.5 cm. in width, and about 1.5 cm. in depth. The tumor did not appear to extend through the wall but presented itself at the fimbriated end of the tube. The left ovary appeared to be normal. The right tube and ovary appeared to be normal. No evidence of implants were seen on the peritoneal surface of the organs.

Microscopic Section.—Sections of the Fallopian tube confirmed the frozen section impression of papillary adenocarcinoma of the Fallopian tube. The tumor showed fairly well differentiated epithelium in most areas. In other areas, however, there could be seen considerable pleomorphism, loss of polarity, and hyperchromatism of the epithelial cells. In one of the sections there appeared to be invasion of the wall of the tube. No implants on the peritoneal surfaces of the Fallopian tubes or the uterus were observed in the routine sections of the ovaries and uterus showed no evidence of tumor.

Diagnosis.—Papillary adenocarcinoma of the Fallopian tube, primary left.

The patient had an uneventful postoperative course. A question of postoperative x-ray was discussed with several consultants including two x-ray specialists. They felt that since no evidence of extension was found, x-ray therapy should be reserved for a later date should she

develop a recurrence. The patient made several postoperative visits to the office, the last one in November 1958, approximately fourteen months after surgery. At this time she had had no complaints. General physical examination was negative. Pelvic examination was negative. The chest x-ray was negative. Her hemoglobin was 14 gm., sedimentation rate was 20 mm. in one hour, and the urinalysis was negative. This patient's prognosis appears to be good because of the localization of the tumor without gross or palpable spread.

Comment

The case that has been presented was interesting from several aspects. The patient presented the characteristic triad of symptoms: vaginal discharge, palpable mass, and abdominal pain. However, it wasn't until she began to have hematometra that the diagnosis was entertained. I must admit that the diagnosis was made chiefly by the process of elimination. It is interesting to note that numerous vaginal smears were negative and that smears of the fluid from the uterus were negative. Following establishment of the diagnosis postoperatively several cytologic observers were unable to find any carcinoma cells in the slides. The early recognition of primary carcinoma of the Fallopian tube will remain difficult because of the lack of specificity of symptoms and the fact that the lesion is so frequently masked by associated pathological conditions. Although in the case being presented the Papanicolaou smears were negative, there is little question but that cytological smears should offer the best possibility of pre-operative diagnosis. The author disagrees with the use of hysterosalpingography as a diagnostic procedure because of the possibility of dissemination of the cancer. Culdoscopy is of questionable value as an aid in diagnosis because the gross appearance of the affected tube is seldom distinctive. In the Frankel series, the diagnosis could not be made in nine of ten cases at laparotomy and in only three of Tatum's seventeen cases were the diagnosis made at the time of surgery.

Summary

1. Primary carcinoma of the Fallopian tube is a rare gynecologic entity, making up approximately 0.5 per cent of all female genital tract malignancies.

2. A case of primary carcinoma of the Fallopian tube has been presented.

3. The difficulties in diagnosing the disease are discussed.

4. The Papanicolaou vaginal smear used routinely may be of definite aid to early diagnosis.

5. Salvage rate may be improved by early diagnosis and adequate surgery.

References

1. Renaud, quoted by Doran, A.: Primary carcinoma of the Fallopian Tube. Tr. Path. Society, 39:208-210 (London) 1888.
2. Orthmann, quoted by Boxer: Bertrag Zur Kenntnis des Tuben Karzinoms. Monatsschr. f. Gebortsch v. Gynaek, 30:549-570, 1909.
3. Barth and Sanger: Martins "Handbuck der Krankheiten der welblicken Adnexorgane. Leipzig: E. Besold, 1895.
4. Wharton, L. R., and Krock, F. H.: Primary carcinoma of the Fallopian Tube. Arch. Surg., 19:848, 1929.
5. Finn, W. F., and Javert, C. I.: Primary and metastatic cancer of the Fallopian Tube. Cancer, 2:803-814 (Sept.) 1949.
6. Hu, P. Y., Taymor, M. L., and Hertig, A. T.: Primary carcinoma of the Fallopian tube. Am. J. Obst. & Gynec., 59:58, 1950.
7. Lofgren, K. A., and Dockerty, M. B.: Primary carcinoma of the Fallopian tubes. Surg. Gynec. & Obst., 82:199-206, 1946.
8. Wechsler, H. F.: Primary carcinoma of the Fallopian tube. Arch. Path. & Lab. Med., 2:161, 1926.
9. Fullerton, W. D.: Primary carcinoma of the Fallopian tubes. Am. J. Surg., 48:467-472, 1940.
10. Curtis, A. H., editor: Obstetric and Gynecology, 2:1042. Philadelphia: W. B. Saunders Co., 1933.
11. Frankel, A. M.: Primary carcinoma of the Fallopian tube. Am. J. Obst. & Gynec., 72:131, 1956.
12. Mitchell, R. M., and Mohler, R. W.: Primary carcinoma of the Fallopian tube. Am. J. Obst. & Gynec., 50:283-292, 1945.
13. Martzloff, K. H.: Primary carcinoma of the Fallopian tube. Am. J. Obst. & Gynec., 40:804-817, 1940.
14. Brewer, J. I., and Guderian, A. M.: Diagnosis of uterine-tube carcinoma by vaginal cytology. Obst. & Gynec., 8:664, 1956.
15. Fidler, H. D., and Lock, D. R.: Carcinoma of the Fallopian tube detected by cervical smear. Am. J. Obst. & Gynec., 67:1103, 1954.
16. MacLean, K. S.: Tubal malignancy: A method for collecting specimens for cytologic study. Science, 114:181, 1951.
17. Corscaden, J. A.: Gynecological Cancer. Baltimore: Williams and Wilkins, 1955.
18. Papanicolaou, G. N., and Treaut, H. F.: Diagnosis of Uterine Cancer by the Vaginal Smear. New York: Commonwealth Fund, 1943.
19. Tatum, H. J., and Golden, A.: Carcinoma of the Fallopian tube. Clin. Obst. & Gynec., 1:1113-1117, December, 1958.
20. Haupt, W.: Langjährige Heilung eines primären Tubenkarzinoms. Zehtralbl. Gynäk., 57:742 (March 31) 1933.

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Ocular Palsy in Temporal Arteritis

Part III
Neurologic Manifestations of the Arteritides Other Than Temporal Arteritis

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INVOLVEMENT of the nervous system in periarteritis nodosa and closely related types takes quite a different form from that encountered in idiopathic arteritis of the aortic arch and its branches (Takayasu's disease) and therefore each will be dealt with separately. In none is there a close resemblance to temporal arteritis.

1. *Periarteritis Nodosa.*—In periarteritis nodosa by far the commonest site of involvement of the nervous system is the peripheral nerves, with the production usually of a multiple asymmetric neuropathy (mononeuritis multiplex) evoked by ischemic necrosis of the nerve bundles. The tibial, median, ulnar and radial nerves are most frequently involved. Lovshin and Kernohan[50] (1948) found a 52 per cent incidence of peripheral neuritis in periarteritis nodosa and in half of these the illness was ushered in by peripheral neuritis. Boyd's[51] (1940) analysis of symptoms showed that, although the number of symptom-combinations in periarteritis nodosa was almost unlimited, a preliminary *febrile episode* and the early appearance of pains resulting from articular and neuro-myositic involvement were characteristic. The neuritis is very variable and may begin abruptly or slowly, and develop in a single nerve or in all extremities. It may appear first or be a late symptom; it can persist, vanish or fluctuate in severity. The upper and lower limbs are affected with equal frequency and in one case motor signs may predominate, in another, sensory signs. Pain, weakness, tenderness of the nerve trunks, hyperesthesia, paresthesias, sensory loss, diminution or loss of tendon reflexes, muscle atrophy and cramps, may occur.

The cranial nerves may be affected also, with the production of an extra-ocular palsy, facial palsy, vertigo, et cetera. Heathfield and Williams[52] (1954) emphasized the approximately symmetrical distribution of the peripheral neuropathy and its tendency to involve chiefly the lower limbs especially the distal parts. Characteristically, their patients had shooting and burning pains in the lower limbs which were worse at night. In almost all cases, sooner or later the lesions of the peripheral nerves form only part of a widespread systemic disease with the characteristic clinical features of periarteritis nodosa—fever, pallor, loss of weight, pain in joints and muscles, weakness, cardio-pulmonary disturbances, abdominal pain, purpuric or ecchymotic areas in the skin, subcutaneous or intracutaneous tender nodules, hypertension, hematuria, and so forth. An exception to this generalization was the case of Kernohan and Woltman[53] (1938) in which a most extensive

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arteritic involvement of the peripheral nerves was found and virtually not another lesion elsewhere in the body.

Symptoms and signs of involvement of the central nervous system are not uncommon in periarteritis nodosa and take a variety of forms reflecting the nature of the lesions (infarction, hypertensive hemorrhage, rupture of aneurysm, cerebral edema, et cetera) and their haphazard distribution. Convulsions, hemiplegia, disorientation and confusion are commonest. Occasionally, the picture of subarachnoid hemorrhage or meningitis may be prominent (headache, rigidity of the neck and corresponding cerebrospinal fluid changes). Chorea, blindness, ptosis, ocular palsies, transient attacks of cerebral ischemia, diabetes insipidus and an encephalitis-like state have been reported. Malamud and Foster[54] (1942), in their review of 300 cases of periarteritis reported in the literature, found clinical signs referable to the nervous system in sixty-five cases (21 per cent). The incidence of some of the abnormalities was as follows: generalized convulsions, 8 per cent; organic cerebral syndrome, 4.7 per cent; hemiplegia, 3.7 per cent; cerebellar signs, 3 per cent; increased cerebrospinal fluid protein, 2 per cent; extraocular palsy, 1.7 per cent; increased lymphocytes in the cerebrospinal fluid, 1 per cent; and subarachnoid hemorrhage, 1 per cent. Involvement of the peripheral nervous system was not included in this analysis. Many of these manifestations can be accounted for by the presence of severe hypertension secondary to chronic arteritic lesions of the kidneys, for example, headache, convulsions, intracerebral hemorrhage with subarachnoid extension, papilledema, and impairment of vision.

However, many instances have been reported in which direct involvement of the cerebral vessels by the arteritic process has been demonstrated on pathologic examination, and the following paragraphs briefly summarize most of these cases. Their over-all incidence is low, Rose and Spencer[31] reporting that 3 per cent of cases with lung involvement and 4 per cent of cases without lung involvement, showed brain lesions.

The earliest papers on the subject are often difficult to assess because syphilis may have complicated the picture. Dickson[55] in 1907 summarized the literature up to that time and referred to several cases in which the vessels at the base of the brain or along the spinal cord showed nodular thickening—"hard round grains," "gummatous nodules," "caseating yellow nodules," and the like. For example, the patient of Chvostek and Weichselbaum[56] (1877) had headache, dizziness, vomiting, fever and a right hemiplegia. Pathologically, aneurysms were found on most medium-sized arteries of the body, the cerebral arteries showing some nine aneurysms up to 2 cm. in diameter, one of which had ruptured causing subarachnoid hemorrhage and death. Microscopically, the inflammatory infiltration contained giant cells and the authors attributed the process to syphilis.

Dickson's case was that of a boy aged fourteen and one-half, whose clinical course was marked by hoarseness, abdominal pains, lassitude, fever, repeated convulsions and stiffness of the neck. Pathologically, there were periarteritic nodules on the small and medium-sized arteries of the heart, liver, spleen, kidneys, mesentery, brain and spinal cord; subarchnoid bleeding had occurred from several of the aneurysmal dilatations on the surface of the brain. Microscopically, the lesions showed destruction of the media, and a perivascular infiltration that included numerous giant cells. Asthma was not described, although the arteritic process was granulomatous and the lungs were involved. In Abramow's[57] Case 2 (1899) a student, aged twenty-five, the course was that of chronic nephritis complicated by "neuritis multiplex." Pathologically, nodules were seen along the arteries of many organs and microscopically the cerebral arteries in two sections showed destruction of the wall with perivascular infiltration. Although the author invoked syphilis as the cause, the case was probably one of periarteritis nodosa.

The patient reported by Longcope[58] (1908) ran a seven weeks' course characterized by pains in the joints and calves, malaise, fever, precordial pain, dyspnea, abdominal distention, cardiac enlargement, urinary casts and delirium, especially at night. Autopsy showed multiple peripheral arterial thromboses of renal, hepatic and cerebral arteries. One occipital lobe of the brain showed a soft shriveled yellowish brown infarct and the artery leading to this region was plugged by a firm red and gray thrombus mass. Microscopically the small arteries of the heart, liver, pancreas, testicle, voluntary muscle and brain were involved in an arteritic process. The arterial lesions of the brain must be considered as somewhat equivocal.

The case of Manges and Baehr[59] (1921) was that of a man aged thirty-nine who ran a four months' course characterized by pain in the limbs,

abdominal pain, fever, hematuria, subcutaneous nodules, hypertension and advanced nephritis. Just prior to death the patient had shown several small hard nodules along the right temporal and brachial arteries. Pathologic examination showed healed vascular lesions of the coronary, renal, splenic, splanchnic, bronchial and cranial arteries. There was an aneurysmal expansion of the temporal artery whose walls were extremely degenerated, the media appearing hyaline. The lumen of this aneurysmal sac was occluded by a thrombus of the blood platelet type about two-thirds organized. All signs of inflammation had disappeared and no giant cells were seen. The vertebral artery showed occasional small patches of scarring in the media, the intima was thickened and the internal elastic lamina showed extensive fibrillar degeneration. Only a few small pieces of the intracranial vessels were studied microscopically. The brain showed no gross changes. This is one of the few cases of periarteritis nodosa in which the temporal artery was affected. However, in the formation of an aneurysm the picture was quite unlike temporal arteritis and furthermore no giant cells were found.

Wohlwill's[60] (1923) Case 2 in which seizures had occured along with a multiple neuropathy, showed at post-mortem examination, in addition to a generalized systemic arteritis, multiple areas of encephalomalacia. The small arteries of the basal ganglia and the white matter (not cortex or subarachnoid vessels) were involved in a chronic necrotizing inflammatory process. Giant cells were seen in one focus. The author stated that P. Müller (1899) also found disease of the pial vessels in a case of periarteritis nodosa.

Otani's Case[61] (1924) was that of a woman aged thirty-three with fever, cough, asthma, anorexia, abdominal pain, pains in the limbs and hyperesthesias. The blood eosinophil count was 38 per cent. Pathologically there were typical aneurysms on the arteries of most organs. None was found on the brain vessels but many were seen on the anterior spinal artery and the arteries of the roots and peripheral nerves. Giant cells were found in all medial lesions and were interpreted as a foreign body reaction. This case clearly falls in the granulomatous angiitis group (see below).

In Balo's Case 1[62] (1926), the patient had pains in the limbs, weakness of the lower limbs, uncertain gait, horizontal nystagmus, Babinski signs, fever and incontinence. The duration of the illness was six months. At autopsy there were typical periarteritic nodules on the arteries of the heart and mesentery. The cerebral arteries distal to the first bifurcation of the middle cerebral artery also showed small nodules which often lay in indentations in the brain substance. There were parenchymal softenings in the left basal ganglia, thalamus and cerebellum. A small hemorrhage was found in the left occipito-temporal region. Microscopically the arterial lesions were of all ages varying from acute necrosis to a chronic fibrosing process with sometimes aneurysmal formation.

Weigeldt's[63] (1927) Case 1 was that of a thirty-year-old man who after a two-year course of joint swelling, loss of weight and pains in the limbs, developed a high fever, focal convulsions and signs of meningitis. The cerebrospinal fluid contained 14 to 290 lymphocytes per cu. mm. and 36 mg. per cent of sugar. The blood pressure was 165/100. The meningeal signs gradually cleared but papilledema appeared. The patient died in congestive heart failure five months after the onset of the more acute stage of the illness. Autopsy showed typical periarteritis nodosa with aneurysms on coronary and intestinal arteries. A small area of pigmentation was seen in the arachnoid and dura over the left frontal and right occipital poles of the brain. Histologically the brain vessels showed no evidence of periarteritis. It is possible that in this case an intercurrent intracranial infection complicated periarteritis nodosa and the arteritic process had not extended to the vessels of the neuraxis. Weigeldt's Case 2 was that of a man of thirty-nine who rather suddenly developed a high fever and polyneuritis of both legs. Three months later papilledema appeared and still later a sudden hemiplegia developed. The blood pressure was 108/55. Pathologic study showed periarteritis of the peripheral nerves and of the pial and cerebral cortical vessels. The cause of death was a large intracerebral hemorrhage into the region of the putamen. The general pathological findings were incompletely described and it was not stated if the hemorrhage was of the hypertensive type (the left ventricle of the heart was hypertrophied).

In Case of Bennett and Levine,[64] a man aged seventy-one had pains in the arms and legs and recurrent chills and fever for five months at the end of which time signs of meningitis appeared. The cerebrospinal fluid contained 176 leukocytes per cu. mm. chiefly polymorphonuclear cells. All cultures were negative. Autopsy showed a widespread typical periarteritis with some involvement

of the arteries of the central and peripheral nervous system.

Van Bogaert and associates[65] (1932) described a child with asthenia, headache, pain and weakness of the right lower limbs, nuchal rigidity, vomiting, purpuric spots, diplopia, visual disturbance, torsion movements of the trunk, paresis of the left upper limb, and finally quadriparesis and coma vigil. The cerebrospinal fluid contained blood on several occasions. Biopsy of a skin nodule showed typical periarteritis nodosa but an autopsy was not carried out. The case resembles that of Hampel.

In Case 1 of Hampel[66] (1933), a woman of seventy became progressively more confused in the fourteen days before admission. On examination the only abnormal findings were disorientation and restlessness. The cerebrospinal fluid was bloody and the supernatant fluid was xanthochromic. There were 25 leukocytes per cu. mm. The Wassermann test was negative. Death occurred ten days later and at autopsy all organs were grossly normal except the surface of the brain which showed multiple petechial hemorrhages. Microscopically the medium-sized and smaller pial arteries were ringed with collections of leukocytes chiefly lymphocytes and plasma cells and often giant cells were seen. Many of the small arteries showed necrotizing lesions involving a sector of the vessel wall and occasionally a false aneurysm had resulted. Rarely, the affected vessel was thrombosed and recanalized. Small areas of nerve cell destruction lay adjacent to involved vessels. A few of the cortical penetrating vessels were ringed with small hemorrhages but this was the only abnormality within the brain parenchyma. No bacteria were stained. The remaining viscera were not studied microscopically. This case clearly belongs in the group, granulomatous angiitis with chiefly cerebral involvement. The blood in the cerebrospinal fluid had come from the damaged arteries. The author stated that according to Meyer eight authors previously had found giant cells in periarteritis nodosa.

The case reported by Urechia and Elekes[67] (1934) was of a man aged twenty-three with a six-month history of insomnia, weakness, difficulty walking, shooting pains in the limbs, ataxia of upper limbs, incontinence, mutism and convulsions. The blood pressure was normal. The cerebrospinal fluid contained 7 lymphocytes. The brain, grossly, showed numerous small softenings and at least two hemorrhages. Microscopic examination showed arteritis widespread in pial vessels of brain and cord, in the cortex and white matter of the cerebral hemispheres and in the cerebellum, medulla, spinal cord, spinal ganglia and in the kidney and spleen. The lesions included lymphocytes and giant cells and the walls of the affected vessels sometimes showed a necrotizing process. The authors classified the neurologic symptoms of periarteritis nodosa as polyneuritic, encephalitic, with or without meningitis, encephalomyelitic and psychical.

King[68] (1935), in a typical case, examined an eye enucleated because of acute iritis and secondary glaucoma and found an intense uveitis and retinitis which in the latter was predominant in the arteries and periarterial zones. The author includes references to other papers in which only choroidal lesions were described. Goldstein and Wexler[69] (1937) described the case of a woman aged forty-five with widespread periarteritis whose vision had suddenly become poor in both eyes associated with progressive bilateral optic atrophy. Histologic studies after death showed inflammatory changes in the choroidal and short ciliary vessels but not in the central retinal arteries.

In Case 4 of Kernohan and Woltman,[53] the patient had pain in the right supraorbital, mandibular and oral regions, dizziness, blurring of vision, numbness of the left arm and leg, headache, and finally left hemiplegia and stupor. The blood pressure was 130/50. The cerebrospinal fluid pressure was 360 and the fluid contained 10 lymphocytes and 2 neutrophils per cu. mm., and 30 mg. per cent of protein. Only the brain was examined at autopsy and the walls of the large cerebral arteries were found to be greatly thickened and the lumens almost completely obliterated by subintimal proliferation of connective tissue. Foci of inflammation were scattered along the larger arteries in the subarachnoid space. Neither the intracerebral vessels nor the vertebral-basilar system was involved. The infiltration of cells did not include eosinophils or giant cells. It is possible that this case is one of the rare instances of cerebral arteritis without involvement of arteries elsewhere in the body.

Malamud and Foster[54] (1942) reported a case in which the patient noted, in addition to many other complaints, blurring of vision and diplopia. Examination showed that the right pupil was larger than the left but both reacted normally to light and on accommodation. The medial and inferior rectus muscles were paretic on the right; the superior oblique was weak bilaterally. Nystagmus

was also present. The Kahn reaction of the blood was weakly positive. The cerebrospinal fluid contained 18 to 56 cells per cu. mm. (mostly lymphocytes), and 138 to 174 mg. per cent of protein. A muscle biopsy established the diagnosis of periarteritis nodosa. Pain and paresthesias appeared in the upper extremities, headache continued, and neck stiffness was noted. The gait became stumbling and speech was dysarthric. A left hemiplegia appeared later. The blood pressure was 142/94. There was no eosinophilia. Postmortem study revealed numerous small foci of ischemic infarction disseminated throughout the central nervous system and several infarcts in the kidneys. All the large arteries of the brain and internal organs were normal. Microscopically there was widespread inflammation of the small arteries and arterioles, most severe in the central nervous system and less so in the peripheral nerves, muscles and eighteen other organs.

In Case 5 of Wechsler and Bender[70] (1942), the patient had numbness and an unnatural feeling in the face, tongue and scalp, and the lips felt as if they were burned and swollen. The patient also complained of headache, fleeting backache, and attacks of vertigo associated with vomiting. Autopsy performed at another hospital was reported to have shown periarteritis nodosa of the spinal cord and of the sciatic and obturator nerves. The clinical course of the illness was marked by remissions.

Malamud's[71] (1945) second case of cerebral periarteritis nodosa was not as convincing as his earlier report because of the occurrence of an extremely severe widespread destruction of cerebral tissue with relatively few diseased cerebral arteries. The patient, a boy aged five, after an upper respiratory infection had a series of seizures and became decerebrate. The patient died two and a half months later and the cerebral hemispheres were literally transformed into a liquefied spongy friable tissue resembling milk curds. The cytoarchitecture was completely destroyed. Most of the vessels were normal but on the medial surface of the hemisphere there were a few vessels with a perivascular infiltration of lymphocytes.

Winkleman and Moore[72] (1950) described the case of a man aged sixty-three who suffered from asthma for which he received sulfonamides and penicillin. He then developed pain in the right shoulder, tingling in the fingers and toes, weakness and pain in the limbs, inability to walk, fibrillary tremors, hepatomegaly, hypertension (170/120) and uremia. Along with the arteries in many viscera, the pial vessels showed a typical panarteritic process associated with many small infarcts in the brain. There were also old healed lesions. Evidence of recent and old hemorrhage was found in the subarachnoid space.

Of the seven patients studied by Parker and Kernohan[73] with involvement of the central nervous system manifested early in course of periarteritis nodosa, two had the picture of an acute infectious disease of the brain, three were subject to a chronic illness in which polyneuritis was associated with bulbar or cerebral signs, one showed the picture of a rapidly growing glioma of the brain and the last patient, an elderly man, died of thrombosis of the basilar artery and periarteritis nodosa was a completely unexpected finding. Of the four patients described in detail, three had had convulsions, one had a hemianopia, another developed a sudden hemiplegia after a two-month period of contralateral headache, and one patient had difficulty in speaking. The pathologic data were not given.

Walsh[74] referred to two patients with periarteritis nodosa who developed occlusion of the central retinal artery with optic atrophy, but pathologic studies were not made.

Haft et al.[75] (1957) reported the case of a man, aged forty-four, who suddenly developed signs of a complete spinal cord lesion at the T9 level after a two-week period of numbness, pain and weakness of the lower limbs. The cerebrospinal fluid was grossly bloody and at surgical exploration an extensive hemorrhage compressed the spinal cord from T6 to T9. Postoperatively, the clinical picture of periarteritis developed (anemia, eosinophilia, fever, albuminuria and hypertension) and the nervous system manifestations included: right facial paresis, weakness of the right masseter muscle and the right side of the palate, diplopia on right lateral gaze, nuchal rigidity, Jacksonian seizures, a left medial rectus palsy, deafness on the right side, nystagmus on left lateral gaze and visual impairment in the left eye.

Pathologic examination showed a most extensive distribution of arteritic lesions throughout all organs. There were three hemorrhages into brain parenchyma. The walls of the leptomeningeal vessels were fibrosed and their lumens were occluded. The spinal cord was reduced to a dark brown collapsed band in the region of the operation. One

small spinal leptomeningeal artery showed fibrinoid necrosis of its wall. The source of the bleeding was not identified but apparently it stemmed from an arteritic lesion.

In other cases of periarteritis nodosa there has been asymptomatic involvement of the nervous system. In Case 5 of Kernohan and Woltman,[63] there were no neurologic complaints but the cerebrospinal fluid contained 19 lymphocytes and 4 neutrophils per cubic millimeter, and the pressure was 200 mm. of water. At autopsy there were no parenchymal changes in the brain but some of the arteries deep in the sulci of the brain showed a chronic periarteritis. In Wechsler and Bender's[70] Case 6, "microscopically the vessels in the brain showed thickenings and changes in the adventitia suggestive of periarteritis nodosa." In Cabot Case No. 43411, Massachusetts General Hospital,[76] a woman aged thirty-nine with fever, pain in muscles and joints, and petechiae in the skin died suddenly. There were lesions typical of periarteritis in many organs and a single inflammatory focus was found in the brain sections.

The literature contains several further cases which, although quite atypical, are often referred to. Maxwell and Maxson[77] (1941) reported the case of a ten-year-old child who rather suddenly developed pain and blindness in the right eye, numbness of both hands, maniacal behavior, and coma. The spinal fluid was bloody. The blood pressure was 118/68. The patient died twenty-five days after admission. At autopsy the essential lesions were limited to the cerebral arteries, many branches of the middle, anterior and posterior cerebral arteries being occluded by firm gray thrombi; multiple small gray, raised, aneurysm-like bodies lay scattered along the surface of the arteries. The larger cerebral vessels at the base showed no gross lesions. A small hemorrhage lay in the posterior limb of the internal capsule on the right side. The superior longitudinal sinus was thrombosed. Histologic examination of the gray nodules lying on the arteries showed zones of necrosis and polymorphonuclear infiltration. There was no evidence of organization in the thrombi and no inflammation could be seen in the meninges. The remainder of the organs and vessels of the body were normal except for the lungs which showed several small subpleural abscesses. The illustration of the lesions is not very clear. The case is so unusual that one hesitates to include it in the group of arteritides.

In Richardson's[78] (1928) case, the patient developed facial paralysis, ataxia of gait and dysarthria. Examination showed cerebellar ataxia of the arms and legs, dilatation of the left pupil, confusion, visual hallucinations, pseudo-bulbar spasms of laughing and crying and decreased sensation for pinprick and temperature below the first lumbar level. The cerebrospinal fluid contained 426 cells. There was little or no evidence of systemic involvement throughout the course of the patient's illness which ran fifteen months, finally ending in paraplegia. Pathologically, the vessels of the nervous system were grossly normal. Scattered lesions were seen in the white matter of the hemispheres. Microscopically there were widespread vascular lesions of the cauda equina, spinal cord, medulla, and to a much lesser extent of the basal ganglia and cerebral white matter. The pial vessels over the cortex showed typical lesions but the intracortical vessels were not involved. The striking features of the vascular lesions were medial necrosis and an abundance of foreign-body giant-cells in the adventitial inflammatory infiltration. Lesions predominated in the cauda equina and spinal cord. No reference is made to the findings in the rest of the body but, in view of the abundance of giant cells in the lesions, the case would easily fall within the group of granulomatous arteritides to be described below.

In the case reported by Runge and Melzer[79] (1930), a man aged sixty-one over a four-year period developed bilateral facial weakness, weakness of the tongue, severe dysarthria, athetotic movements, changing tonus in limbs, pyramidal signs and possibly a hemianopia. The cerebrospinal fluid was normal (4 leukocytes). At autopsy, there was a most striking and unusual subintimal connective tissue thickening of the arteries of the kidney, heart and brain. Organizing thrombus was common. The media of the involved vessels showed mild foci of damage, the injured tissue being replaced by connective tissue scar. Despite the advanced arterial changes, nowhere was there evidence of perivascular inflammation and the authors after considerable discussion decided that the lesions represented the healing stage of periarteritis nodosa. However, many of the thrombi appeared to have formed recently.

In Lemke's Case 2[80] (1923) the clinical course (not fully described) was marked by weakness, bilateral Babinski signs, spastic gait and temporal pallor of the optic discs. Autopsy showed micro-

scopic periarteritic lesions of the kidney and brain. In the latter there were foci of perivascular leukocytes but no medial lesions were seen. The parenchymal lesions were typical of multiple sclerosis.

Recently, Treip and Porter[81] (1957) described a most unusual case in which a youth of nineteen progressively developed over a period of twenty months memory defect, unsteadiness of gait, clumsiness, optic atrophy, coma and decerebrate rigidity ending in death. The blood pressure was 190/130. Pathologically many areas of softening were found in the superficial cerebrum and cerebellum, the basal ganglia and brain stem being spared. Microscopically the arteries of the subarachnoid space, heart, spleen, kidneys, adrenals, tongue, testes and portal tracts showed extensive intimal thickening and striking widespread vascular occlusion by recanalized plugs. Nowhere was there any evidence of inflammation and the authors considered the illness to be the late stage of either thromboangiitis obliterans or polyarteritis nodosa.

In summary, the cerebral arteries apparently are not commonly affected in periarteritis nodosa; when they are, the clinical picture reflects the widespread distribution of multiple small lesions, rather than presenting a gross focal neurologic deficit as in most stroke cases associated with atherosclerotic vascular disease. Occlusion of small arteries results in tiny areas of ischemic necrosis and any level of the neuraxis, cerebrum, brain stem or spinal cord may be involved. Hemorrhage from inflamed vessels appears to be extremely rare. Systemic disease was evident in all but a few instances (for example, Case 1 of Kernohan and Woltman). It should be emphasized that in only one of the cases summarized was there involvement of the temporal artery or the larger vessels arising from the arch of the aorta (case of Manges and Baehr) and in that case the lesion did not resemble temporal arteritis.

2. *Allergic Granulomatous Angiitis.*—A short time after Churg and Strauss[29] set this type of periarteritis apart as a distinct pathologic form of arteritis, Newman and Wolf[82] (1952) described two cases in which the central nervous system was involved. In their Case 1, paraplegia was present clinically and the patient died six weeks from the onset of his illness. Pathologically, widespread granulomatous lesions with epithelioid cells, giant cells and lymphocytes involved the vessels of the entire neuraxis; however, only the nervous system was examined at autopsy. This case illustrates the difficulties of classification, for the patient had neither asthma nor hypereosinophilia. In Case 2 the patient, an elderly man with asthma for thirty years, developed, over a period of two and a half years, headache, right amaurosis and signs of a peripheral neuropathy and cauda equina lesion. The cerebrospinal fluid contained 55 to 472 white cells (chiefly lymphocytes) and 98-160 mg. per cent of protein. General pathologic examination showed a disseminated vasculitis which was striking in the lungs and testes. The lower part of the spinal cord, the only nervous tissue available for examination, also showed a giant cell arteritis. Significant hypereosinophilia had not been present in life. It is of interest that biopsy of a maculo-papular skin lesion had been reported as "tuberculoid granuloma" (see sarcoidosis below). It is unfortunate that in Case 1 the rest of the body was not examined pathologically and that in Case 2 the lower spinal cord was the only part of the nervous system available. This was not the first description of this type of arteritis to be reported, for the cases of Chvostek and Weichselbaum, Dickson, Otani, Richardson, Hampel and Urechia and Elekes, already referred to, readily fall in this category.

Recently, several additional cases of granulomatous angiitis involving the nervous system have been reported. The first was Cabot Case No. 41152, Massachusetts General Hospital,[83] in which a sixty-four-year-old man had transient diplopia for a few days, one month before admission. Two weeks later he developed headache and confusion and had two generalized seizures. Examination revealed confusion, perseveration, visual impairment, rigidity of all limbs, a Babinski sign on the left and arterial hypertension (190/120). The cerebrospinal fluid, under a pressure of 240 mm. of water, was slightly xanthrochromic and contained 200 mg. per cent of protein and 55 leukocytes per cu. mm. of which 48 were lymphocytes. The patient developed signs of bilateral cerebral disease and rapidly went into coma and died about one week after admission to the hospital. Pathologic examination showed a widespread necrotizing granulomatous angiitis of the small intracerebral arterioles and also an extensive granulomatous exudate in the subarachnoid space. A perivascular cuff of lymphocytes surrounded many venules. There was no involvement of arteries elsewhere in the body save for one renal arteriole which showed

a mild inflammatory infiltration including two giant cells, a picture similar to that found in the brain.

Two cases were presented before the American Association of Neuropathologists in June 1957 by Neubeurger.[84]. The first was a woman aged fifty-two admitted with a three day history of headache, chills and fever and having had a convulsion the day before admission. She became somnolent and developed a left hemiplegia. An exploratory craniotomy was negative and thereafter the patient slowly deteriorated clinically with aphasia and progressive weakness, dying nine and a half months from the onset of the illness. The cerebrospinal fluid contained 40 leukocytes per cu. mm., chiefly lymphocytes, 110 mg. per cent of protein and 76 mg. per cent of sugar. The general autopsy findings were not remarkable except for thickening of the wall and narrowing of the lumen of the left subclavian and axillary arteries. The large cerebral vessels appeared normal but the smaller ones showed a segmental grayish white thickening and on section the brain showed widely disseminated small recent and old cysts and infarcts measuring up to 2.5 cm. in diameter. The involved cerebral vessels lying in the subarachnoid space showed a striking concentric or eccentric intimal thickening narrowing the lumen. The media was extensively damaged in many regions and the accompanying inflammatory exudate included lymphocytes, phagocytes and multinucleated giant cells. The intracerebral vessels were not affected. Unfortunately the diseased subclavian and axillary vessels were not studied microscopically and the report of the general microscopic findings was not given. This case is difficult to classify especially if it is assumed that the subclavian artery was the site of a giant-cell arteritis and that no other systemic arteries were involved. A faint resemblance to Takayasu's disease might be claimed but the scanty involvement of the aortic arch vessels and the emphasis on intracranial lesions would be highly atypical features. Widespread subintimal thickening and mesarteritis of the meningeal arteries have never been clearly reported in temporal arteritis, so that any link with that disease cannot be very strong. The case is here classed under granulomatous angiitis although the failure to involve intracerebral arteries is unusual, being reported only in Richardson's case.[78]

Neubeurger's second case was that of a woman aged fifty-five who was found unconscious, having been previously well and who died three days later. The cerebrospinal fluid contained 55 lymphocytes per cu. mm., 84 mg. per cent of sugar and 130 mg. per cent of protein. The blood pressure was 150/90. Pathologic examination showed numerous minute petechial hemorrhages scattered over the leptomeninges and cerebral cortex. The arteries of the meninges and cortex showed destructive lesions of their walls and were surrounded by dense collars of lymphocytes and multinucleated giant cells. The general pathologic examination was grossly normal but the microscopic studies were not reported. This case is quite similar to Cabot Case No. 41152.[83]

Two further cases were reported by Cravioto and Feigin[85] in 1958. Their first case was that of a man aged fifty-six who, over a period of two and a half years, ran a gradual downhill course marked by the progressive appearance of intermittent vomiting, transient visual disturbances, papilledema in one eye, optic atrophy in the other, Rombergism, transient aphasia, focal seizures, weakness of the legs, a right hemiplegia, stupor and finally death from intractable seizures. The cerebrospinal fluid contained 88 mg. per cent protein. The electroencephalogram was diffusely abnormal. There was little or no evidence of involvement of the body other than the nervous system, and the patient did not have asthma. Postmortem examination which was limited to the nervous system showed perivascular granulomatous collections both within the parenchyma of the brain and in the subarachnoid space, containing lymphocytes and giant cells. While the walls of many small arteries were severely damaged, the exudate often surrounded rather normal appearing vessels and extended diffusely through the subarachnoid space; at times veins appeared to be involved in the granulomatous process. The brain showed multiple small infarcts and focal astrocytosis.

In Case 2, the patient, a young man aged eighteen, died after six weeks characterized by headache, weakness, drowsiness, numbness of the extremities, bilateral hemiplegia, blurred vision, ptosis, dysphagia, bilateral Babinski signs and finally a quadriparesis. The patient did not have asthma. A complete postmortem study showed a giant-cell granulomatous angiitis of liver, lungs, heart, gastro-intestinal tract and brain. The brain was grossly normal aside from mild thickening of the pia-arachnoid on the anterior surface of the brain stem. A few small hemorrhages were found here

and there through the brain, in addition to small infarcts, one of which was a most striking medial medullary lesion. Again the vessels within the parenchyma and in the subarachnoid space were ringed with a giant-cell granulomatous exudate and in places the arterial wall was necrotic or disrupted.

An unpublished case of this disease was studied pathologically at the Massachusetts General Hospital by Dr. Charles Kubik in 1935.

Case 6.—A woman, aged fifty-two, had noted fatigue, increasing lethargy, loss of ambition and disincliniation to engage in her usual activities for two or three weeks before admission to the hospital. On examination, the only abnormality was questionable papilledema bilaterally. The cerebrospinal fluid was under normal pressure. The total protein was 74, the sugar 65 each in mg. per cent. The Wassermann test was negative in the blood. A urinalysis was normal and the blood pressure was 150/100. Within six days the patient became comatose without any definite localizing or lateralizing neurologic signs. Fluid obtained by ventricular puncture revealed, on the right, 3 leukocytes and on the left, 8; 10 mg. per cent total protein on the right, 36 mg. on the left. There were no signs of generalized involvement of the body.

Only the brain was examined pathologically and grossly it appeared normal. A granulomatous inflammatory process affected the arteries of every part examined, meninges, cerebral cortex, basal ganglia, brain stem, cerebellum and choroid plexuses. Lymphocytes, plasma cells, epithelioid cells and abundant giant cells surrounded vessels and extended widely in the subarachnoid space. Of the countless vessels ringed with exudate only a few showed frank necrosis. The larger arteries were almost invariably intact but the walls of the smaller intracerebral arteries (30-60 u) were indistinct and distorted, the endothelium swollen and the lumens of the vessels difficult to identify. The extent of the granulomatous process seemed to be clearly out of proportion to the signs of vascular damage. There was scarcely any reaction in nervous tissue proper.

In another somewhat similar case seen in 1954 at the Massachusetts General Hospital, the diagnosis was established by biopsy of cerebellar tissue removed at operation.

Case 7.—The patient, a man aged fifty-one, had had a "drunken feeling while walking" and attacks of vertigo for about nine months and transient diplopia for seven months. For six months speech was slightly indistinct, the tongue felt big, his head had a full feeling and he had a tendency to veer while walking. For two and a half months increasing deafness had been noted in the right ear associated with a whistling tinnitus. On examination there were horizontal nystagmus on gaze to the left, vertical diplopia on testing with a red glass, complete deafness of the right ear, unsteady gait, mild cerebellar ataxia of the limbs bilaterally and slurred speech. The blood pressure was 140/80. The cerebrospinal fluid was under a pressure of 140 and contained 166 mg. per cent of protein and 40 leukocytes per cu. mm. A pneumoencephalogram was normal. The posterior fossa was explored and all structures appeared normal grossly. Biopsy of cerebellar tissue showed a granulomatous exudate in the subarachnoid space with extension into the parenchyma along small blood vessels. Large accumulations of lymphocytes surrounded proliferated epithelioid cells and rare multinucleated giant cells were present. There was no caseation necrosis and neither tubercle bacilli nor fungi were found with special stains.

Extensive clinical studies showed no evidence of sarcoidosis except for a few cystic lesions in the first phalanx of the right middle finger on x-ray examination. The primary tuberculin test was positive. Culture of the cerebrospinal fluid was negative as was innoculation into guinea pigs. Serological tests were negative for syphilis, histoplasmosis, trichinosis, blastomycosis and coccidioidomycosis. A muscle biopsy was not remarkable. The cerebrospinal fluid sugar was 83, 50, 57, 61 mg. per cent, the last three probably being abnormally low.

Following discharge, weakness of the extremities appeared, ataxia increased, and one year later the patient was unable to walk or stand, living a bed and chair existence. He could still feed himself, was continent and his mind remained relatively intact. The resemblance of the histological appearance in this case to some of the others just described was striking, although neither necrosis nor other evidence of damage to the arterial walls was noted. The blood pressure was always normal. Sarcoidosis has by no means been excluded.

Thus it is becoming clear that clinically there is a cerebral form of granulomatous angiitis in which the neurologic features of the illness predominate over the manifestations of involvement of other organs. Pathologically, the cerebral form is usually part of a generalized process and only in the Cabot case[83] were the lesions proved to be limited almost exclusively to the central nervous system. In the other cases with complete postmortem examination a widespread distribution of the arteritis was the rule. Possibly granulomatous angiitis has a special predilection for the vessels of the nervous system despite Rose and Spencer's estimate of the incidence at only 3 per cent.

Meyer and others[86] (1953), reporting a case which appears to fall within the same group, classed the process as sarcoidosis. In their case, a man aged fifty-one had had headache for ten days before admission and was confused for three days. On examination he was febrile, lethargic and disoriented. The cerebrospinal fluid was under a pressure of 350 mm. of water, contained 10 lymphocytes, 80 to 215 mg. per cent of protein, and

on the third examination was slightly xanthochromic. X-ray of the chest showed patchy and linear densities at the bases of both lungs. The patient's condition steadily deteriorated and he died six days after admission, about sixteen days after his illness began. Pathologic examination showed granulomata in the lungs, kidneys and lymph glands. Frequently they were perivascular and adventitial. The cerebral vessels as they lay in the subarachnoid space were involved in a similar granulomatous reaction which was chiefly perivascular but also extended to the media and several arterioles showed acute necrosis of all layers and recent thrombosis.

The authors found references in the literature to two similar cases described by Zollinger[87] (1942) and ascribed to sarcoidosis. Both cases were reported very briefly: the first was a twenty-one-year-old man who rapidly developed the picture of widespread multiple sclerosis. At necropsy there were granulomas in the brain stem and basal ganglia lying exclusively in the Virchow-Robin spaces and consisting of lymphocytes, epithelioid cells and atypical Langhans giant cells without caseation. Here and there a vessel wall was invaded but the endothelium always remained intact. The second case was that of a woman aged seventy-eight who died in three months of a progressive paralysis of the limbs and face. The pathologic picture was similar to that in the first case but the subarachnoid space also contained granulomas. In both cases the only extracranial tissues involved were lymph glands, especially the hilar nodes of the lungs.

The authors raise a very interesting point concerning etiology and one which cannot be conclusively settled so long as there is no specific or unique criterion clinically or pathologically for the diagnosis of sarcoidosis. A personal review of the published pathologic studies of sarcoidosis with involvement of the nervous system showed no other cases in which the cerebral arteries were undergoing a necrotizing change. Indeed, the only pathologic evidence of an arteritis in sarcoidosis was found in the kidney in Case 9 of Ricker and Clark[88] (1949). Regarding the clinical picture, the cases of Zollinger and Meyer and others bear little or no resemblance to any case of sarcoidosis in the literature. If their cases were in fact an acute or fulminant type of sarcoidosis, one might speculate that the cases of granulomatous arteritis running a clinical course of nine months to four years represent a more chronic form merging imperceptibly with classical sarcoidosis. In the more chronic cases of granulomatous angiitis it is essential to distinguish a granulomatous meningitic process from a primary arteritis, keeping in mind that the subarachnoid space contains so many blood vessels that any subarachnoid process must of necessity surround many of them. Also the possible effect of elevated blood pressure in producing or modifying arterial lesions must not be forgotten.

Finally to be mentioned is an unusual case reported by Rottino and Hoffman[89] (1950) in which a patient with typical Hodgkin's disease developed headache, dysarthria, mental confusion, a pill-rolling tremor, lassitude, failure of the pupils to react to light, convulsions, amnesia, incontinence, athetoid tremor and disorientation in all spheres. Pathologic examination showed a hemorrhage 4 cm. in diameter in the lateral portion of the left frontal lobe and in the immediately adjacent parietal lobe. Sections from many regions of the brain contained granulomatous lesions with a predilection for blood vessel walls. The simplest lesion was a perivascular infiltration of lymphocytes; more complex ones had epithelioid cells arranged like a tubercle and giant cells were seen in some lesions. The brain substance was not involved. There were no Sternberg-Reed cells or organisms. The authors found reports of only four other cases of encephalitis in Hodgkin's disease and none had taken a sarcoid form.

3. *Idiopathic Arteritis of the Aortic Arch and Its Branches (Takayasu's Disease).*—With an occasional exception (see below), the manifestations evoked by this condition have been the result of occlusion of the large vessels arising from the arch of the aorta and the production of ischemia distally. Although the intracranial vessels are not directly involved, neurologic signs due to cerebral ischemia are prominent. Usually girls and young women are afflicted, the age at onset varying from eleven to thirty-six years. The condition predominates in females nine to one. The clinical picture (the aortic arch syndrome) is now well known and includes absence of pulsations in the carotid and temporal arteries and the arteries of the upper extremities, diminished or absent blood pressure in the arms, sometimes hypertension in the lower half of the body, postural syncope, a tendency to hang the head forward, convulsions, dizziness, a predisposition to tussive syncope, cere-

bral claudication, hemiparesis or numbness, aphasia, intellectual deterioration, loss of vision (transient or permanent monocular blindness), optic atrophy, attenuation of the retinal arteries, a visible change in the retinal circulation with changes in posture, cataract, retinal peripapillary arteriovenous anastomoses, retinal vein aneurysms, atrophy of the iris, unusual facial pallor, atrophy of facial tissue, pigmentation of the skin of the face, 'trophic' ulceration of the face, palate or nasal septum, atrophy of gums, loosening of the teeth, loss of scalp hair, lowered mouth temperature, hypersensitivity of the carotid sinus reflex, fatigue of muscles upon chewing, intermittent claudication or weakness of the arms, enlarged collateral arterial channels over the chest at times associated with a thrill and notching of the ribs and raised sedimentation rate. The duration of the symptomatic part of the illness is usually several years and the process probably exists silently for some time before manifesting itself. The other causes of the aortic arch syndrome must always be excluded—atherosclerosis with thrombosis, syphilis, tuberculosis, and healed aortic dissection.

Although the first description of the ocular signs was made fifty years ago, pathologic studies of the disease are still relatively rare. Clinical case reports are appearing with increasing frequency (see Ask-Upmark[90] and Ask-Upmark and Fajers[91]) but the following summary will be limited for the most part to cases which have come to necropsy. In Harbitz (and Raeder's) case[92] (1926), a woman aged thirty-seven, had complained of attacks of flickering vision and recurrent bouts of paresis of the limbs; on examination mental changes, retinal vein aneurysms, atrophy of the face and iris, interruption and intermittency of the blood flow in the retinal arteries and cataract were found. There was no radial pulse on either side and the patient died after suffering successive hemiplegias. At postmortem examination the right subclavian, right common carotid, right vertebral and left common carotid arteries were occluded totally, the left vertebral partially. There was a left cerebral softening. Microscopically, the wall of the left common carotid artery showed fibrous thickening with a heavy inflammatory infiltration along the vasa vasorum containing lymphocytes but no giant cells. The carotid lumen was occluded by vascular fibrous tissue. The right common carotid artery was similarly but less affected while the right internal carotid artery showed no infiltration. The aorta showed an extensive infiltration of lymphocytes and plasma cells but no giant cells.

Marinesco and Kreindler's[25] (1936) patient ran an eight-year course characterized by transitory amblyopia as well as steadily failing vision, giddiness, headache, seizures (particularly on exertion), left hemiparesis, cerebral claudication, and atrophy and pigmentation of the face. Death followed cachexia associated with loss of all her teeth. Postmortem studies showed that the four large vessels arising from the arch of the aorta were occluded by an organized thrombus. No inflammation was seen and at death a fibrocaseous peritonitis was described.

The patient described by Sato[93] (1938) showed the classical picture of Takayasu's disease with arteriovenous anastomoses in the retina and absence of pulsation in all vessels arising from the arch of the aorta. Biopsy of the axillary and carotid vessels revealed occlusion without signs of inflammation. Because the Wassermann reaction of the blood had been strongly positive before the author saw the patient (although negative at the time of his examination) he concluded that syphilitic aortitis was the cause of the syndrome.

Frøvig's[94] (1946) patient, a young woman aged twenty-one, first noted slight periodic curious sensations in her right arm which she could not describe very clearly. They were accompanied by headache, vomiting and obscurations of vision. Later the attacks included weakness of the right leg and difficulty in finding the right word. Six months from the onset a right hemiparesis occurred and a few months later the left side became affected. Transient blindness on walking was noted and cataracts formed bilaterally. No pulsations were felt in the arteries of the arms and neck. Biopsy of a carotid artery showed occlusion of the lumen by proliferated connective tissue. In this specimen there was little or no inflammation but pathologic examination[95] (1951) upon the patient's death (several years after the onset of her illness) showed a giant-cell arteritis of the aorta and the large branches arising from the arch. The cervical portion of the vertebral artery showed moderate intimal proliferation and scattered perivascular lymphocytes. The descending aorta was massively involved. The intracranial vessels were almost free from end-arteritic changes although the cerebrospinal fluid contained up to 227 monocytes per cu. mm. A most extensive collateral system of anatstomotic channels was found

in the neck and the upper ribs were notched. The temporal arteries were not involved clinically. The authors considered the various possible causes and suggested that the arteritis was an allergic-hypererergic response.

Maspetiol and Taptas[96] (1948) recorded the case of a young woman aged twenty-three who presented unexplained ulceration of the nasal mucosa, unusual facial pallor and a left hemiparesis which had developed during a half hour episode of unconsciousness. While under observation, the pulse vanished from time to time from the upper extremities and after four months from the temporal arteries, although the carotid pulsations were still present. Facial diplegia and a right Babinski sign appeared and the patient died five months after admission to the hospital. At the age of eighteen the patient had been anemic, had a whitlow and pain in the upper extremities. At autopsy, the aortic arch was embedded in a mass of firm tissue which had resulted in occlusion of the right common carotid artery and narrowing of the lumen of the other large vessels arising from the arch. Microscopic examination of the right carotid artery showed medial and adventitial thickening with infiltrations of round cells and occasional giant cells, and occlusion of the lumen by a recanalized thrombus. The aortic involvement was almost wholly periarterial. The blood Wassermann test was negative.

Shimizu and Sano[32] (1951), in a review of Takayasu's disease as experienced in Japan (some thirty-three cases have been reported in Japan compared with approximately forty from elsewhere in the world), described the pathologic picture as a panarteritis with an infiltration of lymphocytes and plasma cells, and in some cases Langhans giant cells. They pointed out that the occlusive process in the carotid system may start at the bifurcation of the common carotid artery and extend proximally, rather than beginning in or adjacent to the aortic arch. Likewise, occlusion of the subclavian artery may begin distal to the origin of the vertebral artery. Only a few of the Japanese cases have been studied pathologically.

Ross and McKusick[97] (1953) in their extensive study summarize all the recorded cases of the aortic arch syndrome (or variants thereof). The patient of Ask-Upmark and Fajers[91] (1955) died at the age of forty. At the age of twenty-six corneal opacities were found and at twenty-seven, pains occurred in the arms on subjecting them to effort and the blood pressure could not be recorded in the arms. At age thirty-four cardiac disturbances appeared consisting of dyspnea and tachycardia. The blood pressure in the legs was 240/170. The sedimentation rate was 55 mm. in one hour. Pulsation in the carotid arteries was reduced. At the age of thirty-four, transitory right-sided hemiparesis occurred and the right carotid artery was explored, showing a trickle of blood. The last six years of her life were marked by effort-induced pains in her arms, reduced acuity of vision, attacks of syncope on standing up, and increasing cardiac failure. Finally the patient died in uremia. An ovarian dermoid cyst surgically-removed at the age of thirty-four showed cellular intimal thickenings of the arteries and a small artery removed from the foot at age thirty-five showed pronounced subacute inflammation of all layers of the wall. At autopsy the appearance of the brain was normal except for bilateral microgyria in both occipital lobes and in two 2.5 cm. symmetrical regions of the frontal lobes. The intracranial portions of the large cerebral arteries were normal. The innominate artery was filled with a mixture of organized laminated and fresh thrombotic material extending into the right subclavian artery which was completely obliterated. The right vertebral artery was obliterated for 1 cm. at its origin. The right common carotid artery was filled with thrombus in its lower portion but the lumen became normal some centimeters below the bifurcation. The right internal and external carotid arteries were normal. The left common carotid artery was occluded by a fibrous thrombosis extending some centimeters upwards from its origin. The left subclavian artery was likewise completely obliterated approximately to the level of the origin of the vertebral artery. Microscopically, scanty collections of round cells were found in the adventitia of the innominate artery, common carotids and subclavians. The authors assumed that the arteritis had originally involved all layers of the arteries. Organized thrombus lying at the origins of the renal arteries and almost completely blocking their lumens, accounted for the terminal renal failure.

Recently, Barker and Edwards[98] (1955) described the case of a woman aged sixty-four with substernal pain and increasing cardiac failure of one year's duration. No pulses were felt in the upper extremities except in the left subclavian artery above the clavicle. Postmortem examination

showed myocardial infarction with an overlying mural thrombus. The left subclavian and right axillary arteries were occluded by organizing thrombus. The walls of the left common carotid and the innominate arteries were thickened but the lumens were patent. Microscopically, the entire thoracic aorta, the branches of the aortic arch and the axillary arteries showed an extensive chronic inflammatory reaction. The coronary ostia were narrowed by the inflammatory process in the adjacent aorta. The authors rejected the possibility that embolism had been responsible for the vascular occlusions and rightly concluded that thrombosis *in situ* had occurred In this case there was a modified aortic arch syndrome but no cerebral symptoms had occurred. The temporal arteries were not involved clinically. Insofar as the case resembles Takayasu's disease, it is of special interest from three aspects: (1) the age of the patient, (2) no giant cells were found in the inflammatory reaction, and (3) the coronary ostia were involved.

Beneke[99] (1925) described a case which, although far from typical, bears some relationship to Takayasu's disease. It concerned a woman of forty-one who at the age of thirty-six was seriously ill with epidemic influenza (1918), following which she remained an invalid. At thirty-nine the blood pressure was 180/120, the patient was edematous and a loud aortic systolic murmur was heard. At thirty-nine a left hemiplegia came on suddenly and the cardiac murmur was louder over the great vessels of the neck and abdomen than over the base of the heart. Death resulted from bronchopneumonia. Autopsy showed extensive thickening, chiefly adventitial, of the walls of the thoracic aorta, of the large arteries arising from the arch and of the abdominal aorta whose lumen was greatly narrowed. Microscopically the media of the involved vessels was destroyed and the adventitia greatly increased; a few regions showed a scanty infiltration of inflammatory round cells and rarely giant cells were seen. The author concluded that he was witnessing the chronic stage of a process whose acute phase had taken place many months or years before, possibly during the influenzal illness. The hemiplegia was caused by a hemorrhage into the right putamen and the carotid arteries were not significantly obstructed.

Joób[100] (1947) described the case of a thirty-two-year-old woman with increasing dyspnea for many years. There were signs of mitral valve disease in addition to the classical picture of cardiac failure. The blood pressure in the right arm was 150/100; left arm 225/120. The sedimentation rate was 134 mm. An autopsy showed only severe aortic atherosclerosis without evidence of inflammation. The right axillary artery was almost occluded. This case, although included in some references to the subject of arteritis, does not belong in that category.

With the possible exception of Barker and Edward's case, the fully developed clinical picture of idiopathic arteritis of the aortic arch and its branches has been rather uniform. It has already been mentioned that in no case was temporal arteritis evident, and on the other hand temporal arteritis has not been reported as a cause of the aortic arch syndrome. The data presented in this brief review provide sufficient justification for keeping the two diseases separate at the present time. In the recognition of Takayasu's disease, it is important not to overlook cases with merely a partial syndrome in which only one, two or three of the main brachiocephalic trunks are obstructed.

Summary

1. Two cases of temporal arteritis with extraocular motor palsies have been described. In addition, in Case 1, the clinical picture included diabetes insipidus, dysphagia, trismus and periorbital swelling.

2. The literature pertaining to extraocular palsy in temporal arteritis has been reviewed.

3. Attention is drawn to the occurrence of transient diabetes insipidus in Case 1. The possibility that involvement of the region of the optic chiasm accounts for the pattern of blindness in some cases of temporal arteritis is raised.

4. The occasion has been taken to summarize the present status of temporal arteritis in relation to the other arteritides.

5. The neurologic manifestations of temporal arteritis, periarteritis nodosa, granulomatous angiitis and idiopathic arteritis of the aortic arch and its branches. (Takayasu's disease, aortitis of the young female) have been reviewed and compared.

References

50. Lovshin, L. L., and Kernohan, J. W.: Peripheral neuritis in periarteritis nodosa. Arch. Int. med., 82:321, 1948.

51. Boyd, L. J.: IV. Periarteritis nodosa. Neuromyo-

sitic manifestations. Bull. N. Y. M. Coll., 3:272, 1940.
52. Heathfield, K. W. G., and Williams, J. R. B.: Peripheral neuropathy in periarteritis nodosa. Lancet, 2:673, 1954.
53. Kernohan, J. W., and Woltman, H. W.: Periarteritis nodosa, a clinico-pathologic study with special reference to the nervous system. Arch. Neurol. & Psychiat., 39:655, 1938.
54. Malamud, N., and Foster, D. B.: Periarteritis nodosa. Arch. Neurol. & Psychiat., 47:828, 1942.
55. Dickson, W. E. C.: Polyarteritis acuta nodosa and periarteritis nodosa. J. Path. & Bact., 12:31, 1907.
56. Chvostek, F., and Weichselbaum, A.: Herdweise syphilitische endarteriitis mit multipler aneurysmenbildung. Allg. wien med. Zeit., 22:257, 1877.
57. Abramow, S.: Ueber die Veränderungen der Blutgefässe bei der Syphilis. Beitr. Path. Anat., 26:202, 1899.
58. Longcope, W. T.: Periarteritis nodosa with report of a case with autopsy. Bull. Ayer Clin. Lab. Pennsylvania Hosp., 5:1, 1908.
59. Manges, M., and Baehr, G.: Periarteritis nodosa. Am. J. M. Sci., 162:162, 1921.
60. Wohlwill, F.: Über die nur mikroskopisch erkennbare Form der Periarteriitis nodosa. Virchows Arch. Path. Anat., 246:377, 1923.
61. Otani S.: Zur Frage nach dem Wesen der sogennanten periarteriitis nodosa. Frankfurt Ztschr. Path., 30:208, 1924.
62. Balo, J.: Über eine Häufung um Periarteriitis-nodosa Fällen nebst Beiträgen zur Polyneuritis infolge von Periarteriitis nodosa. Virchows Arch. Path. Anat., 259:773, 1926.
63. Weigeldt, W.: Klinische Beiträge zur periarteriitis nodosa. Deutsch. Ztschr. Nervenh., 100:260, 1927.
64. Bennett, G. A., and Levine, S. A.: Two cases of periarteritis nodosa. One with unusual manifestations (meningeal form). Am. J. M. Sc., 177:853, 1929.
65. Van Bogaert, L., Stoltz, B., and Ley, R. A.: Sur une observation de périartérite noueuse à localization neuro-cutanée et évoluant par poussées hémorragiques. Ann. méd., 31:530, 1932.
66. Hampel, E.: Zwei ungewöhnliche Fälle von Periarteritiis nodosa. Ztschr. f. d. ges. Neurol. u. Psychiat., 146:355, 1933.
67. Urechia, C. J., and Elekes, N.: Les formes nerveuses de l'artérite noueuse de Kussmaul. Ann. méd., 36:466, 1934.
68. King, E. F.: Ocular involvement in a case of periarteritis nodosa. Tr. Ophth. Soc. U. Kingdom, 55:246, 1935.
69. Goldstein, I., and Wexler, D.: Bilateral atrophy of the optic nerve in Periarteritis. Arch. ophth., 18:767, 1937.
70. Wechsler, I. S., and Bender, M. B.: The neurological manifestations of periarteritis nodosa. J. Mt. Sinai Hosp., New York, 8:1071, 1942.
71. Malamud, N.: A case of periarteritis nodosa with decerebrate rigidity and extensive encehphalomalacia in a five-year-old child. J. Neuropath. & Exper. Neurol., 4:88, 1945.
72. Winkleman, N. W., and Moore, M. T.: Disseminated necrotizing panarteritis (Periarteritis Nodosa). J. Neuropath. & Exper. Neurol., 9:60, 1950.
73. Parker, H. L., and Kernohan, J. W.: The central nervous system in periarteritis nodosa. Proc. Staff Meet. Mayo Clin., 24:43, 1949.
74. Walsh, F. B.: Clinical Neuro-ophthalmology, 2nd edition, Williams and Wilkins Co., Baltimore, 1957. page 897, cases 418 and 419.
75. Haft, H., Finneson, B. E., Cramer, H., and Fiol, R.: Periarteritis nodosa as a source of subarachnoid hemorrhage and spinal cord compression. J. Neurosurg., 14:608, 1957.
76. Cabot Case 43411. New England J. Med., 257: 718, 1957.
77. Maxwell, E. S., and Maxson, W. T.: Cerebral type of periarteritis nodosa. Case report. The New Internat. Clin., 2:216, 1941.
78. Richardson, M.: Läsionem des Zentralnervensystems bei Periarteriitis nodosa. Ztschr. f. d. ges. Neurol. u. Psychiat., 115:626, 1928.
79. Runge, W., and Melzer, R.: Über periarteriitis nodosa mit Starker Beteiligung des Zentralnervensystems. Jour. f. Neur. & Psychiat., 40:298, 1930.
80. Lemke, R.: Ein Beitrag zur Frage der Periarteriitis nodosa. Virchows Arch. path. Anat., 240:30, 1923.
81. Treip, C. S., and Porter, R. J.: An unusual form of widespread vascular disease of the brain in a youth. J. Neurol. Neurosurg. & Psychiat., 20:50, 1957.
82. Newman, W., and Wolf, A.: Non-infectious granulomatous angiitis involving the central nervous system. Tr. Am. Neurol. A., 114, 1952.
83. Cabot Case 41152, New England J. Med., 252: 634, 1955.
84. Neubeurger, K. T.: Giant-cell arteritis involving small meningeal and intracerebral vessels. Read before Amer. Assoc. of Neuropath., June 16, 1957. Later published—McCormick, H. M., and Neubeurger, K. T., J. Neuropath. and Exp. Neurol., 17:471, 1958.
85. Cravioto, H., and Feigin, I.: Granulomatous angiitis of the Central Nervous System. Paper read before American Assoc. of Neuropath., June 15, 1958.
86. Meyer, J. S., Foley, J. M., and Campagna-Pinto, D.: Granulomatous angiitis of the meninges in Sarcoidosis. A.M.A. Arch. Neurol. & Psychiat., 69:587, 1953.
87. Zollinger, H.: 2 Fälle von grosszellig-skelerosierender lymphangitis cerebri (Morbus Boeck). Schweiz. med. Wchnschr., 23:1136, 1942.
88. Ricker, W., and Clark, M.: Sarcoidosis. Am. J. Clin. Path., 19:725, 1949.
89. Rottino, A., and Hoffman, G.: A Sarcoid Form of Encehpalitis in a patient with Hodgkin's Disease: Case report with review of the literature. J. Neuropath. & Exper. Neurol., 9:103, 1950.
90. Ask-Upmark, E.: On the "Pulseless Disease" outside of Japan. Acta Med. Scandinav., 149:161, 1954.
91. Ask-Upmark, E., and Fajers, C. M.: Further observations on Takayashu's syndrome. Acta med. Scandinav., 155:275, 1955.
92. Harbitz, F.: Bilateral Carotid Arteritis. Arch. Path. & Lab. Med., 1:499, 1926.
93. Sato, T.: Ein seltener fall von arterien-obliteration. Klin. Wchnschr., 17:1154, 1938.
94. Frøvig, A. G.: Bilateral obliteration of the common carotid artery. Thromboangiitis obliterans? Acta Psychiat. et. Neurol. Supplement 39 Einar Munksgaard, Copenhagen, 1946.
95. Frøvig, A. G., and Löken, A. C.: Syndrome of obliteration of the arterial branches of the aortic arch due to arteritis. Acta. Psychiat. et. Neurol. Scandinav., 26:313, 1951.
96. Maspetiol, R., and Taptas, J. N.: Thrombose des gros troncs de la crosse de l'aorte chez une jeune femme ses rapports avec les diverses artérites thrombosantes. Semaine hop. Paris, 24:2705, 1948.
97. Ross, S. R., and McKusick, V. A.: Aortic Arch Syndromes: Diminished or absent pulses in arteries arising from arch of aorta. A.M.A. Arch. Int. Med., 92:701, 1953.
98. Barker, N. W., and Edwards, J. E.: Primary arteritis of the aortic arch. Circulation 11:486, 1955.
99. Beneke, R.: Ein eigentümlicher Fall schwieliger Aortitis. Virchows Arch. & Path. Anat., 254:722, 1925.
100. Joób, A.: Zwei eigenartige Fälle von arterienerkrankung. Schweiz. med. Wchnschr., 28:431, 1947.

The Relationship Between the General Practitioner and the Specialist

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Here is a concise presentation of the important role of both the generalist and the specialist in our society.

THE relationship of the Generalist and the Specialist and the place of each in the world of medicine during the next generation constitutes one of the most widely discussed subjects and one of the most pressing problems in medical circles today.

The question is often raised as to whether in today's medical world of specialization, with nineteen recognized specialties, five sub-specialties and twenty-seven subdivisions of specialties, there is actually a place or even a need for general practitioners. And if there is a need, what kind of a doctor should he be? What should be his training? Is a one year rotating internship sufficient to enable him to discharge his responsibilities? Should the specialties share the responsibility with the medical schools for the continuous education of the family physician? Or, is the internist destined to become the family doctor with complete elimination of the generalist?

The answers to these questions are very important—important to medical educators who are currently making drastic alterations in the pedagogy of preclinical and clinical training and important to the American people whose attitude will in the long run determine whether the family physician is to survive or perish. And in this day of Kaiser-Permanente plans, health insurance plans, community health association plans, United Mine Worker funds, salaried physicians, the practice of medicine by Blue Cross, and the elevation of the hospital to the point where the board of trustees may dominate the practice of medicine, the study of the future of the general practice of medicine and its relationship to specialization becomes even more engaging.

The American people are not ignorant of the advance of medical knowledge. They know that with the tremendous development of specialized techniques in anesthesiology, in medicine and in surgery, the complete consultation facilities of a departmental hospital offer the very zenith of diagnostic and therapeutic skill. And yet, they sense that with today's super-specialization something has been lost in the triumph of scientific medicine.

Something has been lost in this rapid march of science in the treatment of human beings. That something is the human individual himself—the human being with a soul.

The treatment of the sufferer as just a mass of diseased protoplasm with a hospital number attached to him goes far afield from the tender solicitude of the old family doctor who breathed confidence and courage into his patient, although he sat at the bedside with few specific agents at his command.

Presented by Dr. Hildebrand at the annual meeting of the Minnesota State Medical Association, Duluth, May 25, 1959.

Doctors Hildebrand and DeTar are both past presidents of the American Academy of General Practice.

While the modern trend of specialization has elevated the science of medicine although neglecting its art, one cannot blame today's medicine for a fault which is of ancient origin. Centuries ago Plato complained, "For this is the great error of our day in the treatment of the human body, that physicians separate the body from the soul." Voltaire was just as critical, but a bit more spicy: "A physician is one who pours drugs of which he knows little into a body of which he knows less."

These are all simply different modes of expression of the same thought: that the patient, the sick person, whether in Plato's time, in Voltaire's time, or in our time, values the treatment of his soul equally with the treatment of his body.

Is there a gross incompatibility between the science and the art of medicine? We hold that there is not. We do not accept the old adage "the more the art the less the science."

What is "the art?" There are many definitions. We like this one: "The art of medicine is the skill with which the physician applies his technical knowledge."

Art must complement and supplement science. Neither can exclude the other and still constitute adequate therapy. The highest quotient of art is compatible with the utmost degree of science.

These statements revolve around the basic problems of generalist-specialist relationships.

It is quite apparent that American medicine is just as concerned with the soul of the patient as were Plato and Voltaire. The medical school, the American Medical Association, the American Academy of General Practice and all of the specialties are concerned.

This concern and the actions resulting therefrom are of great importance to medicine as a whole, not just to general practice or to specialization. They are of importance to young physicians seeking to find their proper place in the medical economy of tomorrow.

Medical students are tremendously interested in hearing about general practice. They are concerned with the quality of practice, with hospital privileges, with board certification. They wonder if they should become certified in internal medicine in order to do high quality general practice, and if so, how they will receive adequate training also in pediatrics, obstetrics and the care of traumatic cases.

However, despite the obvious need for a greater supply of family physicians, and despite the just as obviously expressed desire of the American people for an increase in the supply of family physicians who will assume this total continuing responsibility for the health of the individual and his family, there is incontrovertible evidence to prove that our present system of medical education and our present system of hospital organization are contributing to the demise of the general practice rather than to its survival.

Look at the figures: Only 30 per cent of the class of 1930 were found in general practice five years later. This figure went down to 26 per cent of the class of 1945 and 18 per cent of the class of 1950. Projection of this curve to 1980 would approach the zero mark. Fortunately there are signs that the pendulum may be swinging upward again, but not rapidly enough to compensate for replacement, let alone a population increase of over three million a year.

Ninety-four per cent of all residents are now engaged in specialty training and only six per cent are engaged in training for general practice, despite a surplus of general surgeons and a shortage of general physicians.

There are some very definite reasons why medical students and interns who start with high idealism of service to mankind through the medium of general practice finally finish their training in a specialty. These reasons fit into three categories: First, medical school training by specialists having no contact with and no understanding of general practice. Second, graduate training during internship and residency providing unlimited high quality training programs for the specialties and the extremely limited residency opportunities in general practice. Third, the fear of interns, that if they do take general practice residency, their hospital privileges will be no greater than if they had not spent the extra year or two years for proper preparation.

One student describes his training for general practice like this: "Here there is no subject matter in general practice—no family to visit to follow through our medical teachings. Marked dogmatism in each department is present with apparently little attempt made to look at the patient as a whole. If it's an itch—to the allergy clinic. If it's an itch with a rash—to the dermatology clinic. If she's bleeding, GYN gets her. If she's not bleeding, send her to the endocrine clinic. If it's a joint ache, then the orthopods and arthritic clinic

will have a fight over it, and one by one it goes down the line. It's all topped off by the university frowning on rotating internships."

There is little wonder that his school and many others are producing a plethora of specialists experiencing difficulty in locating where they are needed, and a shortage of generalists who are needed but not being produced.

Fortunately, this picture is changing a little.

But first, how about the fear, and the legitimate fear, of the intern that he will not be allowed to practice good medicine in the hospital of his choice as a generalist; the fear that he will not secure a staff appointment, and if he does that he will have no opportunity to demonstrate his professional competence and to secure privileges in proportion to his capacity?

The Wisconsin Surgical Society recently drafted into its by-laws a directive which prohibits its members from participating in any type of preceptorship training program and from assisting a generalist at the operating table.

The Griffen Hospital at Derby, Connecticut, has removed all extension of surgical privileges except for physicians who are board-certified. There is no provision for recognition of demonstrated ability.

A hospital in Newark, New Jersey, will not let a generalist do a simple episiotomy or rupture membranes, not even with the permission of the chief of the section of obstetrics or the resident in obstetrics.

One generalist in Richmond, Virginia, reports that the generalist must turn over his emergencies to a specialist in order to get a bed for his patient.

One generalist in Baltimore, Maryland says that he can admit patients below the age of twelve or above the age of twelve, but not both. In other words, he may practice pediatrics or medicine, but not both.

One of the interns in Pittsburgh applied for staff privileges at the Mercy Hospital where he was finishing his internship. He was told that the staff was sorry, that he had been good enough to intern there but that staff privileges were restricted to specialists and he would do better to apply elsewhere. He applied at the Southside Hospital. There he was told the staff was sorry but he would not qualify because he had not interned there. Do you think such examples as these are shocking? We do. We think they demonstrate a cleavage between specialists and generalists which threatens the very structure of private practice as we know it today. The same cleavage preceded the advent of socialized medicine in Britain. It involves not only professional jealousies, professional selfishness, the prelude to the end of general practice, the threat of governmental control, but it also involves the whole economics of medical care.

The cost of medical care is intimately related to the question of whether the hospitalized patient is shunted from specialist to specialist without supervision of the family physician who knows him best, or whether the personal physician is allowed to supervise his care, utilizing specialty consultation but exercising the guiding hand of control over his financial and medical interests and providing continuity of medical attention. The proper supervision of the patient is directly related to the total cost of his illness and to the direct corollary thereof, government control of medical care.

There must be some middle ground between unlimited, uncontrolled, unchecked low-quality hospital practice and the absurdities of exclusion and limitation. From every point of view, that of sound medicine and that of sound economics, the generalist should be integrated into the modern hospital organization.

Neither the generalist nor the specialist is equipped to render complete medical service; each must be complemented by the other.

The diagnosis of the nature of the generalist-specialist problem is relatively easy. Put in a nutshell, the etiology of the problem is fivefold:

1. The rise of the specialties in keeping with the rapid advance of scientific knowledge.

2. The overproduction of specialists and the underproduction of generalists.

3. The development of the hospital as a community health center, with expensive diagnostic and therapeutic facilities that no one practitioner can finance, a trend aided and abetted in no small degree by the rapid rise of voluntary sickness insurance—our own Blue Shield and Blue Cross.

4. The voluntary self-regulation of the profession and the hospitals in the interest of elevating standards.

5. The insistence by some specialists that board certification be accepted as the standard of competency, countered by the insistence by generalists that demonstrated professional capacity and not

board certification be so accepted. No generalist can show certification in medicine, surgery, obstetrics and pediatrics.

To these five causes may be added the foibles and shortcomings of the human personality with the admission that not all doctors are immune to selfishness and professional jealousies.

The therapy is more difficult. It involves many factors, six of which might be mentioned.

1. Specialists must recognize that the development of medical technology does, in truth, limit the field of every physician, generalist and specialist and that no one physician can cover the field. Further, the generalist must define with greater accuracy the field of general practice.

2. Specialists must recognize that the generalist must be accorded a place in the community hospital. He must first have that membership.

3. Specialists must agree to the allocation of hospital staff privileges in accordance with demonstrated professional capacity and must be willing to cooperate in a teaching program which will enable the generalist to engage in a continuous educational process, thus fulfilling his obligation to both his profession and to society.

4. Medical education must undergo radical alteration to the end that emphasis once again will be placed on the patient as a person rather than on his regional pathology. In other words, the patient must be desegmentalized. Medical educators must so alter their program that the product will be a well-trained, undifferentiated physician prepared for either a specialty or general practice. And this is not an easy task.

5. The outmoded, antiquated, inadequate one-year rotating internship must be abolished and in its place must be established a two year properly organized residency or prolonged internship, as the case may be, for general practice which will enable the young generalist to discharge his professional responsibilities in keeping with today's high standards of medical care.

6. Board certification in general practice must be established not only to afford the hospital staff a means of appraisal of the young generalist applicant, but also to provide a goal of attainment for the general practice resident, without which general practice residencies will continue to go begging.

This may sound to you like a lot of medicine for the cure of disease, but I want to assure you that work is in progress in every single one of these fields and in some it is progressing very rapidly.

In 1953, the AMA House of Delegates directed that a new committee, the Committee on Medical Practices, should start work in an attempt to determine the underlying causes of these unfortunate relationships between specialists and generalists and to recommend a solution. That committee reported first in 1954 with definite recommendations on which the House of Delegates acted:

"It was never intended that staff appointments of hospitals generally, or even in hospitals approved for residencies, should be limited to board-certified physicians as is now the policy of some hospitals. Such policies, if practiced extensively, are detrimental to the health of the American people and therefore to American medicine. Hospital staff appointments should depend on the qualifications of physicians to render proper care to hospitalized patients as judged by the professional staff of the hospital and not on certification or specialty society membership."

The House proceeded to direct that the Committee on Medical Practices be a continuing committee to report every six months, which has been done since December, 1955. Sub-committees have been appointed which are hard at work on many facets of the problem. Medical education circles have reacted to the potentials engendered by the formation of this committee. Many medical schools have set up departments of general practice, and the Congress on Medical Education devoted an entire meeting evaluating education for general practice.

As a result of the long work of this Committee, the AMA House of Delegates will soon hear the recommendations of the special sub-committee on preparation for general practice on a new two year program proposed for medical school graduates planning to become family physicians. This is, in a sense, an expansion of the one year rotating internship which most generalists now take and would replace the present internship. Family practice was chosen as the name for this field since the emphasis is on the medical care of the family regardless of age. The sub-committee predicted that there would be an increased need for the family physician.

A minimum of eighteen months experience in the diagnostic, therapeutic, psychiatric, preventive and rehabilitative aspects of medicine and pedia-

trics should, in a very broad sense, be part of the two year program.

A physician could then elect to spend the remaining six months of additional study in any part of the program that he desired. However, a physician who plans to practice obstetrics should spend at least four months of the elective period in obstetrical training. This entire plan will be reported in detail to the AMA House of Delegates meeting in Atlantic City.

The American Academy of General Practice has taken the lead in the fight for the development and production of better trained generalists, with the realization that the generalist must elevate his standards if he is to survive, that he must engage in continuous post-graduate studies to elevate these standards, and that he must fight for the right to practice in the hospital of his choice in accordance with his professional talents.

The Academy of General Practice believes that the education of its members should be a continuous process. It believes that education on the hospital staff level should be a continuous process and that no applicant, generalist or specialist, should be accorded full privileges on any hospital staff until the staff has had an opportunity to observe him in the discharge of his professional duties. It believes, with the cooperation and assistance of the internist, the pediatrician, the obstetrician and the surgeon, that a great contribution can be made to the quality of medical care by a program of continuous in-hospital training in each department in which a generalist works.

The Academy believes that such in-hospital training and sponsorship will provide, not only education, but incentive for young generalists and it will swell the ranks of family physicians.

It is an interesting observation that all of the resolutions on the improvement of general practice and the right of the generalist to hospital staff privileges in accordance with his ability which were passed by unanimous vote of the House of Delegates of the American Medical Association, were so passed by a body consisting of over 75 per cent specialists voting, not in selfish defense of their own specialties but rather in defense of the institution of general practice which they considered an integral and important segment of American medicine.

It cannot be said that specialists as a class are blind to the dangers inherent in the threatened extinction of general practice.

It cannot be said that the bigoted and myopic attitudes of some specialists represent the majority any more than can it be said that those generalists who demand surgical privileges exceeding their professional competence represent the majority.

It cannot be said that generalists as a class are satisfied to render second-rate medical care or are blind to the necessity of maintaining pace with the advance of medical knowledge and technology. It cannot be said that today's medical educators as a class are satisfied with their techniques or their results.

The expressed attitudes of the American Medical Association, the Specialist societies, the American Academy of General Practice, and the Association of American Medical Colleges all attest to the truth of these statements, exceptions to the contrary not withstanding. The locus of greatest need today is on the hospital staff level. It is our personal impression that problems on this level in most areas through the country show promise of solution.

The signs of progress are most encouraging. After all, there are few questions of such gigantic complexity that they cannot be analyzed and solved by reasonable intelligent people sitting together around the conference table.

When the attitudes and policies of the national medical organizations have found their way into local staff organizations in hospitals, these problems which have loomed so large in the recent past will evaporate, a process which will be beneficial not only to the generalist and the specialist and to all of medicine, but also to the too often forgotten man—the man who pays the bills—the patient.

The Norse god Thor was once taunted by the giant Utgard-Loki into attempting various tests of strength and prowess. Among them he was challenged to lift a cat. To his humiliation, Thor found that he could not budge the animal. It turned out that this was no ordinary cat. It was the exposed portion of the fabulous Midgard serpent whose body encircled the earth. Trying to lift it, Thor had been straining to lift the entire world. I would hope that every resident in specialties and every specialist could be made to understand that his specialty is Loki's cat, and that what he sees of it above the surface may appear small and easily manageable but that in reality it is of necessity bound to the universe.

Editorials

JOHN F. BRIGGS, M.D.
ARTHUR H. WELLS, M.D.
HENRY G. MOEHRING, M.D.

THE LAW-MEDICINE CENTER

An Experience in Working Together

The philosophy of the Law-Medicine Center in Cleveland is based on the belief that society must solve certain medico-legal problems of man through unity and not diversity, through one center and not two schools, through mutual cooperation and not divisive controversy. Medicine and law when they have met in the administration of justice have too often generated much conflict and confusion. Not only have law and medicine suffered but also justice.

The specific purpose of the Center is to improve the administration of justice—both civil and criminal—through better use of medicine as a source of truth for the law.

In 1953, to achieve this purpose, Western Reserve University and the Cuyahoga County Coroner's Office cooperated to present an instructional program in law-medicine problems. That year the Coroner's Office opened its new $800,000 laboratories on the University campus adjacent to the School of Law, School of Medicine and Institute of Pathology. This public health office of local government has major medico-legal problems in its daily activity. Dr. Samuel R. Gerber, Coroner since 1936, University officials, and public-spirited citizens labored for several years prior to educate the voters of the County on the wisdom of voting for the necessary public bond issue to build a new scientific coroner's office in the University environment. By an overwhelming vote the concept and the building were approved.

The cooperation between the governmental office supported by the taxpayers of the county and the privately endowed, voluntarily supported University has grown broader and deeper since 1953. The spearhead for this cooperation is the Law-Medicine Center officially created by the University trustees in 1954.

Administration of the Center rests in the director, a full-time member of the School of Law faculty, the Cuyahoga County Coroner, Dr. Gerber, and the Director of the Institute of Pathology, Dr. Alan R. Moritz, who also serves as Professor of Pathology in the School of Medicine and is an internationally recognized leader in forensic medicine.

In the University structure, the Center represents not a school but a service institution. For University administration the Center is placed under the Dean of the School of Law. The vigorous support of Dean Emeritus Fletcher Reed Andrews and the present Dean, Dr. Edgar I. King, has been a potent factor for success.

The law-medicine program completing an operation of seven years in February, 1960, has conducted fifty-two separate courses or schools for instruction. In civil justice, sixteen courses or seminars have been given; in criminal justice, thirty-six courses or schools. The student registration for civil justice instruction has totalled nearly 1,200 while criminal justice has attracted over 1,300. These students represent doctors and lawyers, law students and medical students, law enforcement officials (police, prosecutors, probation and parole officers, coroners and medical examiners), insurance claimsmen, industrial relations personnel, labor union officials, social workers, and others. Nearly 300 individuals have served as instructors both from the University faculty and the community of Greater Cleveland, the state of Ohio and beyond.

Current budget of the Center is $40,000 annually. The bulk of the expense is measured by faculty honoraria. In 1954 a $20,000 grant from the Cleveland Foundation, America's pioneer community trust, enabled the program to begin. Since then several interested corporations and individuals have given a total of $7,500 but in the past year only $1,000 of the income came from gifts. The remaining $39,000 represented tuition and service fees, primarily the former.

The Center has published several books and monographs, has conducted research, has provided surveys for law enforcement agencies and has tested law enforcement personnel. Details of these functions—instruction, publication, research, sur-

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vey, testing—will be described in articles to follow. Some challenging aspects of future law-medicine problems will also be presented.

The central theme of philosophy, purpose and function at the Center—*to use medicine in law to achieve justice*—is vitally affected by man's current law-medicine knowledge and skills being in a state of volatile change. Law and medicine when cooperating in the administration of justice must be prepared to recognize this condition of swift change in modern man's intellect and above all to adapt to this condition to resolve human problems in the medico-legal area. A free, democratic society laboring cooperatively through public offices and private enterprises is our best hope in today's challenging world. The Law-Medicine Center is a unique cooperative activity of such labors by government and university to solve a common problem. By-products of the activity are the dignifying of the professions of law and medicine but, more important, better service to the client-patient—an individual human being with complex medico-legal problems.

OLIVER SCHROEDER, JR.

DIGITALIS TREATMENT OF HEART DISEASE

There have been a number of recent discussions concerning the use of Digitalis. It is most interesting to all who have been concerned with the use of Digitalis in the treatment of heart disease, that despite all of the advances by the pharmaceutical houses and the pharmaceutical chemists, very little has been added to the basic understanding of Digitalis. The multiplicity of the products on the market are totally confusing to most physicians and it is suggested now that the physician should select one whole leaf product, an oral glycoside, and an intravenous product as part of his armamentarium. It is not necessary to know all of the Digitalis preparations on the market. It is only necessary to know the characteristics of the preparation to be used. Nothing is gained by jumping from one product to another. For those patients who do not require digitalization, the whole leaf product is still the best. In individuals who require rapid digitalization and who can take the drug orally, it is suggested that an oral glycoside should be used. For those individuals in whom the emergency is great and no other method seems available, intravenous use of Digitalis is indicated.

The indication for the use of Digitalis, except for certain arrhythmias, is heart failure.

In heart failure Digitalis should be given until there has been complete digitalization. The amount of Digitalis that produces digitalization varies from individual to individual. The drug, however, should be given until the symptoms of digitalization appear. Once the patient is digitalized, he should be kept on maintenance doses of Digitalis. The knowledge that has been added to our better understanding of Digitalis has altered in no way the original directions given by Withering, the discoverer of Digitalis. When digitalization is indicated, it must be remembered that effective digitalization results from individualization.

J.F.B.

SYPHILIS IN MINNESOTA

The report of syphilis as a problem in Minnesota is most gratifying. The issue of *Minnesota's Health,* Volume 13, Number 2, gives a succinct account of the solution of the syphilis problem in this state. Unfortunately, the title of this article reads "Minnesota Eliminates Syphilis as a Serious Public Health Problem." Dr. H. G. Irvine would be the last to believe that syphilis is no longer a serious public health problem. His wisdom, his clinical knowledge and his superb understanding of the venereal disease problem brought about our envied position in venereal disease control. It must be emphasized that we have not eradicated syphilis; we have controlled it. The success of Dr. Irvine's program will continue only as long as all lay and professional groups continue their moral and financial support to his philosophy of "syphilis control."

EPIDEMIOLOGY OF LUNG CANCER

In the past twenty-five years, the death rate from lung cancer among male residents in the United States has risen from four to twenty-four deaths per 100,000. Lung cancer is responsible for about 10 per cent of all cancer deaths and is the most frequent cause of cancer death in the male patient. The increase in deaths due to lung cancer is primarily limited to males and to the epidermoid and undifferentiated types of carcinoma. Presently, to every female death there are between four and five males who succumb—and this ratio seems to be widening.

A great deal of speculation exists on how much of the above increase is real. The above statistics are obtained from death certificates and necropsy studies. It is well known that data from death certificates can be erroneous. Our increasing longevity, better diagnostic methods and accuracy, and increased awareness of this disease form the basis for the belief that much of the increase in incidency is relative. When the above three factors are taken into consideration, it still appears that there has been a real increase in lung cancer during the last twenty-five years.

Our present concept of the etiology and pathogenesis of lung cancer postulates that this disease results from chronic exposure of the bronchial epithelium to external irritants or carcinogenic materials. Carcinogenic materials paralyze the normal sweeping action of the ciliated bronchial epithelial cells. The irritation produces increased mucous secretion, distention of the goblet cells, and a crowding out of the ciliated cells. This gives the carcinogen access to underlying basal epithelial cells and over a period of time there is progression from basal cell hyperplasia to squamous metaplasia, cancer *in situ,* and finally bronchiogenic carcinoma.

Evidence is available that prolonged contact with chromates, asbestos, arsenic, and nickel are associated with an increased incidence in lung cancer. During the last decade, and particularly in recent years, excessive cigarette smoking has taken the spotlight as the major cause of lung cancer. The advocates of the cigarette smoking theory base their argument on approximately thirty retrospective and prospective studies which have been conducted in this country and in England. All of these studies show a statistical association between excessive cigarette smoking and the incidence of lung cancer. Many of the conclusions of these studies have been questioned for the following reasons: (1) the problem of inaccuracies in data obtained from death certificates, (2) the problem of obtaining accurate retrospective smoking histories, (3) and bias in selection of participants in the prospective studies.

The prospective studies not only show a statistical association between smoking and lung cancer but also with almost every disease investigated. This immediately brings up the question, "Is it possible that cigarette smoking can be responsible for so many dissimilar diseases?" The proponents of the cigarette theory believe this is possible, while the opponents sight this as further evidence for questioning the accuracy of these statistical studies.

Probably the most important contribution of these statistical studies on smoking has been to stimulate basic research on the possible etiologies of lung cancer. Studies on the bronchial epithelium in smokers and non-smokers have shown that the degree of change in the epithelium from loss of ciliary action to carcinoma *in situ* is roughly proportional to the number of cigarettes consumed. It has also been shown that certain aromatic hydrocarbons in tobaccos are carcinogenic for certain animals.

The studies on the bronchial epithelium were done on autopsy specimens taken from persons who died from lung cancer and other causes. The majority of these patients were in the fifty to sixty-five year age groups. It would be well to try to correlate smoking histories and epithelial changes in persons in the third, fourth, and fifth decades of life to learn how long it takes to bring about the mentioned degenerative changes.

It appears that a great deal more research on the physiology of lung cancer plus animal experimentation and identification of carcinogenic agents is needed before we can make the statement that cigarette smoking is the major cause of lung cancer. Certainly, heredity, socio-economic level, occupational contacts, air pollutants, and other factors need further consideration as etiological agents. Maybe cigarette smoking is not the conclusion to the book on lung cancer, but only one of its chapters.

WAYNE MATHY, M.D.

SPEED AND TRAFFIC ACCIDENTS

Excessive speed was by far the biggest single cause of traffic accidents that caused more than 2,825,000 injuries and 36,700 deaths on U. S. highways during 1958, according to a recent insurance company report.

It was estimated that speed killed and injured nearly 1,000,000 persons in the United States last year, more than 40 per cent of the total.

Cars that did not have the right of way were involved in 25.2 per cent of the accidents causing a total of 608,400 injuries during the year. Reckless driving was blamed for 10.4 per cent of the injuries; cutting in for 4.0 per cent and improper signaling for 3.6 per cent.

President's Letter

SINGING THE "BLUES"

In unions there is strength, and, not to be discounted, is the possibility that organized labor at its convenience will use its power to provide medical care for its members. One wonders whether or not that trend has already begun.

In New York City, for instance, the major labor unions are now seriously considering establishment of their own health insurance program and chain of hospitals "to bring medicine closer to the people." A study is being made by a special council, prompted by bitterness over the recent New York Hospital strikes and dissatisfaction with Blue Cross and Blue Shield coverage.

The union claims that "we have sweatshop health standards in our hospitals. They underpay their staffs and under serve their patients. They make no accounting to the public. Yet, we are confronted with skyrocketing costs that must be paid out of our welfare funds." They claim that labor representatives are outnumbered five to one on the Blue Cross Board of Directors. Represented on the study committee are twenty-six of New York major labor organizations, whose combined pension and welfare funds total $750 million. It was pointed out, however, that the funds are under joint labor-management administration and could not be used for hospital construction without approval by employers.

There will be a great challenge confronting Blue Cross and Blue Shield if jointly administered pension and welfare funds are used to finance hospital construction and operation and to maintain health insurance programs. "We intend," the committee said, "to determine how far short present facilities are of meeting the city's needs in terms of quality, quantity and cost."

New York Blue Cross has been criticized "for failing to heed the voice of labor." It has been pointed out that the recent increase in Blue Cross rates, in the New York area—averaging 26 per cent—meant a 33 per cent rise in rates for the type of coverage purchased by most unions and this coming on the heels of last year's 22 per cent increase. The Central Labor Council represents 600 New York local unions with a combined membership of 1,000,000—these members, and their families, comprising the backbone of New York Blue Cross and Blue Shield enrollment.

In meeting the challenge, what can Blue Cross and/or Blue Shield do? John R. Mannix, Executive Vice President of Blue Cross of Northeast Ohio, has recently stated that Blue Cross "desperately needs a shot in the arm to give it a nation-wide growth spurt" and that Blue Cross "is suffering from hardening of the arteries and has lost the pioneering spirit that sparked its phenomenal growth in the 1930's."

Mannix feels that the eighty-odd plans operating across the United States are not up to dealing, individually, with employes, and labor unions, which want nationwide coverage. Therefore, he suggests that the American Hospital Association in co-operation with the American Medical and Dental Associations, if they agree, get a federal charter for an American Blue Cross as a voluntary, nationwide organization.

The United States, noted Mannix, is the only major nation with no government-controlled health plan, but action must be taken today to strengthen the voluntary medical system of which voluntary hospitals are a key component—or else.

Sincerely yours,

Benjamin B. Foulston M.D.

President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

DELEGATES HEAR GHAA HEALTH CARE VIEWS AND AIMS

Paul R. Hawley, M.D., Director of the American College of Surgeons, in a banquet address given in conjunction with the 1959 Institute of Group Health Associations in New York City, told delegates "there is one thing worse than no medical care; and this is poor medical care." He pointed out that "most medical care insurance plans increase quantity of care with no regard for quality, and actually encourage bad care."

According to Doctor Hawley, one-half of the operations in the United States today are performed by doctors "who are untrained, or inadequately trained, to undertake surgery. The medical care insurance plan makes its largest annual payments for surgery to practitioners without proper qualifications."

In other comments, Doctor Hawley pointed out that only a few health care plans give high quality. Said Doctor Hawley "one of the phenomena in medical care is the confidence placed by the average patient in a license to practice medicine and surgery. Too many patients regard this license as evidence of competence in every aspect of medical care."

Continued Doctor Hawley, "only the few existing plans combining prepayment with group practice have been successful in providing medical care of high quality" because "they select the physicians who give the medical care. Too many of the public are not competent to make an intelligent choice."

HIP Director Describes Effective Medical Care Program.—David P. Barr, M.D., President and Medical Director of Health Insurance Plan of Greater New York, presented the following description of what he considered effective medical care. Said Doctor Barr, "a plan in which prepayment is for service rather than indemnity can offer greater satisfaction to subscribers, greater scope, continuity, and a high quality of care." He said group organization is most important and should be a "true community of interests with pooling and sharing of knowledge, experience and equipment as well as income."

Weakness in Health Coverage Plans Noted.—Dr. Franz Goldmann, formerly of Harvard's School of Public Health, in addressing the GHAA noted that most present health insurance programs do not meet all health needs. He referred to lack of the following as weaknesses in present health insurance programs: Psychiatric care for diagnosis and short-term treatment; Dental service, at least for maintenance care, if not for wider services; Health care for "senior citizens"; Diagnostic and visiting nurse services in Blue Cross plans and extension of hospitalization with full service benefits; "More emphasis on prevention through early diagnosis and prompt and thorough treatment, including medical rehabilitation, 'the front line of attack on dependency' "; "More administrative research, including evaluation of the performance of specific types of plans and assessment of their end results and value."

Doctor Goldmann pointed out to GHAA delegates one reason why these needs are still outstanding is the popular idea that health insurance is not an organized program of medical care but a financial arrangement for payment of certain medical bills.

According to Doctor Goldmann, other reasons frequently given are lack of actuarial basis for extending benefits, lack of demand for them, problems on scope of coverage, and high costs.

Medical Goals Listed.—According to Frederick, D. Mott, M.D., Executive Director of Community Health Association, Detroit, Michigan, "the backbone of good group medical practice" is competent, highly motivated doctors.

He listed the following inducements to attract top caliber doctors: Opportunity for professional growth; provision for medical research; well-equipped group centers; satisfactory remuneration; teaching atmosphere; good supporting staff; availability of a good hospital; and non-salary benefits.

IS THE COST OF MEDICAL CARE TOO HIGH?

Why medical costs are high, as well as what you get today for your medical care dollars, are stories that should be told in a positive way to the American public.

This was the consensus reached by a group of individuals representing medicine, the hospital and pharmaceutical fields, labor, the insurance industry and the ministry at the A.M.A.'s 1959 PR Institute in Chicago.

At the Institute in Chicago's Ambassador West Hotel an entire morning was devoted to a session to determine whether medical care costs are actually too high.

Labor Costs Boost Hospital Costs

Staged in the style of a congressional committee hearing, the session, which was moderated by George Cooley, Secretary of A.M.A.'s Council on Medical Service, heard testimony from the following:

Ray Brown, Director of the University of Chicago Clinics, pointed out that hospital costs rose from an average of $9.39 per patient a day in 1946 to $28.17 in 1958, chiefly due to increased labor costs. Brown pointed out that since hospitals operate a service business, automation does not effect any saving, and wage increases cannot easily be absorbed. There is little chance, Brown said, that hospital costs can be reduced much. Consequently, the medical and hospital professions must talk positively about the forces responsible and explain to the public the advances purchased by the legitimate increased cost.

Public Demands Greater Service

Leonard Martin, Assistant Director of A.M.A.'s Economic Research Department, testified that even though today the patient gets more for his money in terms of diagnosis and treatment, medical cost will always be a factor because people invariably want more service. Stressing that deterioration in hospital care would bring on socialized medicine, Martin said if everyone could be insured for hospital care, people wouldn't be concerned about medical care cost.

Medical Care Produces Top Results

Fred Roll, Director of Public Relations for Smith, Kline & French, Philadelphia, said that while more money is being spent on medical care, top results are being obtained. New drugs are responsible for great advances; the public does not think drugs are expensive "if they work," Roll said. Today's average prescription price is under $3.00 but the entire health team must make personal explanations of this fact and the fact that drugs are high risk products to the public.

Broader Voluntary Health Insurance Coverage

Lawrence Wells, Director of Promotional Activities for Blue Shield Medical Care Plans in Chicago, said survival of voluntary health insurance depends upon performance of Blue Shield—and extension beyond groups, inclusion of senior citizens, broader coverage and comprehensive public education in regard to indiscriminate demands. Economic understanding is vitally needed in regard to what insurance can and cannot do, Wells said, and he urged the medical profession to take the initiative in conducting such an educational campaign to assure continued free enterprise in medicine.

Insurance Industry Offers Cooperation

Arthur Browning, Vice President in Charge of Group Insurance for the New York Life Insurance Company, testified that the health insurance industry is ready and willing to cooperate with the medical and hospital fields to let the public know what the true cost of medical care is. He said the public continually demands broader insurance programs and pointed out that rates must change with changes in service. A recent survey showed that people were more concerned with what they were getting than what they were paying. Browning said abuses of insurance are great in the proprietary hospital field. Since doctors control ninety-five per cent of these hospitals, the medical profession must determine what is going on, especially in big population areas, and correct these abuses.

Unions Want Medical Care "Price Tag"

James Brindle, Director of the Social Security Department for the United Auto Workers in Detroit, said the unions want a price tag on medical care and would like to see organized medicine take the lead in providing service insurance programs. Other indefinite types are unsatisfactory and vague. He also said medical policies should be more medically oriented and added that doc-

tors must run medical insurance programs. Although unions do not like the deductible features in insurance policies, Brindle said Americans have not yet hit the limit in the amount of wages which people will allocate for medical care if the policy offered is good.

Many Questions—Same Answer

In the question period, Dr. L. M. Lichter brought out the fact that insurance abuse is difficult to measure but that in Michigan 75 per cent of the physicians believe the profession is capable of solving this and related medical economic problems. He said the Michigan State Medical Society has set up a referral committee to handle such matters and to settle them fairly for all concerned.

Dr. Donald Harrington, President of the Foundation for Medical Care, San Joaquin County Medical Society, Stockton, California, outlined the San Joaquin County Medical Society's owned and operated Foundation of Medical Care. This organization of participating doctors sets up health insurance contracts, and maintains a claims office for medical review on a local basis.

Doctor Russell L. Deter, Chairman of the Committee on Voluntary Health Insurance and Health Care Costs of the Texas Medical Association, El Paso, Texas, explained the new program being set up by the Texas Medical Association to reduce insurance abuses and Mr. Milo J. Vondracek, Secretary of the Rock River Methodist Foundation, Chicago, suggested the following means of communicating the cost story to the public: letters to county medical societies outlining the problems in the health insurance field with requests for help; educational exhibits; an A.M.A.-produced film for national showings; editorials and fillers for medical society journals; county society symposia; presentation of information on the problem before Medical Student Days programs in orientation programs for new medical society members; and establishment of committees to handle cost and abuse problems.

NOW IT'S PRESCRIPTION INSURANCE

Another experiment in pre-paid care started in March, 1958, in Essex County, Ontario, when Prescription Services, Inc., began as the first known pharmaceutical prescription plan in Canada. It serves an area with a population of 200,000, and agreements with all but seven of the seventy-five pharmacies involved have been signed. A progress report on the first six months shows that of 548 persons enrolled in the last month 104 had 211 prescriptions filled with an average ingredient cost of $1.86 and average retail price of $3.72. Organized labor has been favorable to the new plan, but management has been frank in its opposition to providing another fringe benefit for employes. Sponsors believe that the plan can succeed with slight modifications.

MEDICAL TESTIMONY PLAYS MAJOR ROLE IN "PILL BILL" SUIT

Medical testimony played a major role in a significant legal battle which was in progress in Minneapolis during September and October, when ten members of the Minnesota State Association took the stand to describe the dangerous properties of over-the-counter drugs and medicines.

During the course of a lengthy trial in Hennepin County District Court, where the State made its most recent attempt to halt the sale of drug products by Red Owl, Inc., a supermarket food chain and Groves-Kelco, Inc., a wholesale jobber, medical witnesses testified on the deleterious effects of ingredients contained in over-the-counter preparations and cited instances of harm resulting from their use.

Dr. Haddon Carryer, Head of the Allergy Section, Department of Internal Medicine, Mayo Clinic, described aspirin as a frequent cause of severe allergic reactions and gastro-intestinal bleeding. Acetophenitidin, an ingredient of an aspirin compound involved in the case, is frequently responsible for hemoglobinemia, he said.

Deleterious effects of aspirin on the blood were brought out in testimony by Dr. Howard L. Horns, Minneapolis specialist in hematology and former assistant dean of the University of Minnesota School of Medicine.

Among these effects, he said, is the production of prothrombin, a substance associated with the formation of blood clots. Doctor Horns also stated that in patients under treatment with anticoagulant drugs, aspirin can upset the coagulation balance to the point where serious hemorrhage might result.

Questioned concerning Bromo Seltzer, Doctor Horns said that acetanalid, one of the principal ingredients of this product, may produce hemoglobins which are incapable of carrying oxygen.

Acetanalid may also result in a depression of

the white count in certain individuals, he said, leaving them peculiarly susceptible to infection.

Complications resulting from the use of certain oil-base preparations were described by Dr. John F. Briggs, Saint Paul, who is Chairman of the Section on Diseases of the Chest of the American Medical Association.

In testifying on Vicks cough syrup and Va-tro-nol, he said a drop of oil lodging in the lung as the result of the use of such products can cause oil pneumonia and tumor of the lung.

Dr. J. A. Bargen, Chairman, Department of Gastroenterology, Mayo Clinic, referred to the findings of a nine-year research study in his testimony concerning laxatives. In a group of 265 patients observed during this period, all of whom were long-time users of laxatives with histories of digestive difficulties, he said twenty-seven had undergone a permanent change in the structure of the colon. In these cases, he explained, the haustura had disappeared, resulting in a condition which can be mistakenly diagnosed as colitis.

Dr. Leon Harris, Minneapolis ophthalmologist, said that his clinical experience indicates that prolonged use of Murine eye preparation can result in conjunctivitis.

Dr. Raymond N. Bieter, Head of the University of Minnesota Department of Pharmacology testified at length on the deleterious effects of acetanalid, yellow phenolphthalein and other ingredients found in products which figure in the case.

In testimony concerning incidence of accidental aspirin poisoning, Dr. Richard Raile said that Minneapolis General Hospital, where he is chief of Pediatric Service, recorded 262 cases, one resulting in death, between 1955 and 1956.

Dr. Robert D. Semsch, a Minneapolis pediatrician who is associated with both local and state poison control centers, expressed his belief that information on ingredients and directions for use accompanying many over-the-counter drug products are inadequate for the protection of public health and that labeling does not include sufficient data on contraindications.

During the course of the trial, the defense repeatedly protested that the state had failed to produce evidence of specific instances of harm resulting from the products involved.

On October 7, Dr. Harry Bell, Duluth, took the stand to describe in detail his treatment of a two-and-half year old boy who was brought to him with severe abdominal spasms after ingesting Ex Lax in a Red Owl supermarket.

He was followed by the patient's mother who testified that she placed the chocolate-flavored laxative, which she said she obtained from a self-service rack, in the grocery cart in which the youngster was riding. While she was occupied at a nearby counter, the boy consumed half the contents of the package, she said.

At another point in the trial, Dr. Orley Foster, Minneapolis, related the history of a patient whose condition he diagnosed as bromide poisoning resulting from the habitual use of Bromo Seltzer.

The products involved in the testimony given by these medical men were Murine, Anacin, Alka Seltzer, Bromo Seltzer, Bufferin, Lysol, Pinex, Vicks cough syrup, Va-tro-nol, Aspergum, Aspirin compound tablets, Bromo Quinine, 4-Way Cold Tablets, Pepto-Bismal, Feen-A-Mint, Sal Hepatica, Castoria and Ex Lax.

Representatives of the manufacturers of these preparations came from various parts of the country to observe the proceedings in the Minneapolis court room. This group of spectators included Dr. Frederick G. Cullen, former executive vice president of the Proprietary Association and currently the chief Washington, D. C., lobbyist of that organization.

The lawsuit is regarded as a test case which will establish a precedent of vital significance not only in Minnesota but in other parts of the country where the unregulated sale of drugs and medicines is being opposed.

The defense rested its case largely upon the argument that the products in question are free from regulation by the Pharmacy Board under the provision of the Pharmacy Act which exempts "harmless, non-habit forming, proprietary medicines when labeled in accordance with the requirements of the state and federal Food and Drug Act."

Medical testimony was vital to the support of the State's contention that the products are potentially harmful and that their unregulated sale endangers public health, according to William W. Essling, assistant state attorney general who presented the case for the state.

Beldin H. Loftsgarten represented the Minnesota State Pharmaceutical Association, which intervened in the case on behalf of the State.

Public Health

AN APPRAISAL OF AIR POLLUTION IN MINNESOTA

For some time, the Minnesota Department of Health has been aware of an increasing interest and concern regarding present and potential air pollution problems in Minnesota. To determine the extent of this problem, the Department's Division of Environmental Sanitation, with co-operation from the U. S. Public Health Service, took the first step in a state-wide appraisal of air pollution in Minnesota on October 1.

The objectives of the survey are to assess the nature and extent of air pollution in the State, to inventory and summarize existing State and local legislation relating to air pollution and to assess the present air pollution activities in the State. These data will provide a basis upon which the State or local agencies may determine the type of legislation which would be most suitable and a basis upon which they may determine the type and extent of activities that should be undertaken.

The survey will be conducted through interviews and questionnaires with public and private officials and through field visits to appropriate communities in the State. Data from previous studies and on population and industrial growth, fuel use, topography and climatology and on refuse disposal practices will be compiled and analyzed. Air quality measurements will be made on a limited scale.

Questionnaires have been sent to appropriate municipal officials and to other agencies in the State that might have a knowledge of how air pollution is affecting their area. Persons receiving the questionnaire are urged to return them as soon as possible so that they may serve as a basis for further survey planning. Personal visits will be made to as many communities as possible in all areas of the State with priority given to areas where recognized problems exist.

It is expected that the survey will be completed in about six months and that the report on an Appraisal of Air Pollution in Minnesota will be available for distribution next fall.

DISABILITY DAYS IN THE UNITED STATES

As a result of illness and injury, workers with family incomes under $2,000 per year lost an average of 10.3 days from work during the twelve months ending June 30, 1958, as compared with a loss of 5.9 days for those in families earning $7,000 and over, according to findings of the U. S. National Health Survey of the Public Health Service.

An inverse relationship existed also between income and other forms of restricted activity, such as days in bed due to illness and injury.

Workers sixty-five years of age and over lost about eleven days from work compared with 8.4 days for those in the forty-five to sixty-four year group and 6.3 days for those aged seventeen to forty-four.

City children lost 9.0 days from school, on the average, as a result of illness and injury; rural nonfarm children lost 7.8 days; and farm children lost 7.3 days. However, farm children fifteen and sixteen years of age lost about 10 days from school as compared to 6.5 days lost by urban children of these ages.

This information appears in the latest of a series of published statistical reports issued by the U. S. National Health Survey. The data apply to the total civilian population of the country, exclusive of persons confined to long-term institutions.

Respiratory illnesses, as a group, were the leading cause of activity restriction. They were responsible for 40 per cent of all activity restriction and half of all days in bed. The totals for this group of diseases were affected by the Asian influenza epidemic, but even in a normal year the respiratory diseases are likely to head the list.

Circulatory diseases, including heart disease, ranked second in terms of total volume of disability, followed by injuries and their chronic effects, with digestive diseases running a close fourth.

The data are derived from the continuing nationwide household interviewing with a representative sample of the population, conducted for the Public Health Service by the U. S. Bureau of Census. The information recorded about individuals is confidential and only statistical totals are published.

From "Disability Days, United States, July 1957-June 1958," Public Health Service Publication No. 584-B 10, Government Printing Office, Washington 25, D. C.

The Art of Medicine

PR

Carl H. Woyke, B.A.
Editor

LISTEN TO YOUR PATIENTS

"My physician doesn't let me know what's the matter with me," was one of the most common complaints heard by those persons who staffed the Medical Association's booth at the 1959 Minnesota State Fair.

"Listen to your patients," is the advice given by Dr. Jacob H. Conn in the May, 1959 issue of the *Maryland Medical Journal.*

According to Doctor Conn, psychobiologic therapy is a collaboration between physician and patient, each learning from the other. It can never be patterned after a preconceived plan, but must always be modified and adapted to a specific patient's needs in a particular life situation. The patient usually comes to the doctor convinced that his abdominal distress or cardiac dysfunction is due to only one possible cause—a disturbance of organic functioning, totally unrelated to his way of life.

The need to talk is basic. Next to bodily activity, talking is the best method of alleviating tensions. It gives the patient the opportunity to discharge pent-up feelings and provides him with a sympathetic listener, the physician, upon whom he depends for understanding and guidance. Treatment, therefore, begins by the physician's listening to what has gone wrong. It literally is a form of auscultation, and like auscultation of the heart sounds, one must pay particular attention to everything that is heard. It is impossible to present a list of fixed rules that can be used in this phase of psychotherapy. The following general principles will be of assistance:

(a) *Listen patiently to what the patient is saying.* It gives him a feeling that you are genuinely interested in him as a person.

(b) *Do not interrupt when he seems to talk of inconsequential trifles.* There is no such thing as irrelevance in a patient-physician interview. The patient is expressing his feelings as well as talking about facts.

(c) *Think along with the patient.* Ask yourself not only what is he saying but how he is saying it, and why does he say what he does at this particular moment? Does he need sympathy? Is he misinformed? Does he feel guilty, and therefore is seeking reassurance? Is he angry, afraid, sad or evasive as he approaches a sensitive personal topic?

(d) *Show a real interest and personal warmth in what is going on.* Ask for more details, examples, or amplifications of what already has been stated in outline fashion. Ask, "Then what happened?" "So?" "And then," or more pointedly, "Why?"

(e) *Avoid criticism and argumentation.* The patient can accept only a part of what you feel or know to be the whole truth. He has been deceiving himself over a long period of time and is not able to see himself as objectively as others may see him. Therefore, never tell him he is "neurotic" or that "nothing is wrong" or that he is "seeking sympathy."

IS MEDICINE ON THE RIGHT TRACK?

Today, there are many individuals and groups who are challenging the devoted public-service minded intentions of the American man of medicine. Not infrequently his doctor-patient relationship is in danger because of constantly changing public attitude toward him and the art which he practices.

These transitions may be reflected in legislation, the cost of medical care, and attitudes toward aging to mention a few. Because it is essential that the individual physician stay abreast of these changes and proceed accordingly, the American Medical Association annually sponsors a Public Relations Institute for state and county medical society executives and public relations personnel.

Setting the stage for the opening session of AMA's 1959 Public Relations Institute at Chicago's Ambassador West Hotel, August 20 and 21, Leo Brown, Director of AMA's Communications Division, asked two vital questions:

Is medicine on the right track?

Is the non-scientific side of medicine keeping pace with scientific advancement?

Brown said this is a question other groups and institutions also are facing in this space age.

"Caught in the cross-currents of conflicting political and social philosophies, organizations as well as nations are finding it necessary to reassess their positions and their policies."

Medicine Faces Many Challenges

"Medicine finds itself once again fighting 'socialized medicine'—this time wearing the garb of a social security hand-out," Brown said. "The possibility that this legislation may succeed is a very real one. The medical profession cannot afford to be a pufferbilly engine, chugging along lazily, impervious to the upheavals in the world around it."

The alert, progressive and public-service minded men of medicine should be challenged by the problems of today, he pointed out. In addition to defeating legislation that threatens to undermine America's fine medical care system and educating people again to the excellence of our democratic free choice system, it is time for medicine to take more intense interest in what people say are the problems in the health field.

"Many a piece of legislation stems from what politicians claim is a 'desperate need.' Well, let's find out if there *is* such a need. If there is, let's *do* something constructive about it. If there isn't, let's *tell* people about it."

Creative Thinking Necessary

Brown said medicine has the solutions to many of its current problems within its own hands. Physicians must do some creative thinking about the route medicine will travel in the years ahead and activate the men in the profession to play a more active role in developing resourceful programs and providing more community leadership.

"Better to be an engineer on the medical train, carrying the responsibility for the safe passage of those aboard, than the brakeman on the caboose, waving the flag too late," Brown said.

He concluded that probably no professional group is less selfishly motivated but is more criticized for selfish interest than the medical profession. He said community service is one important way medicine can identify itself with public interest rather than selfish interest.

HEALTH EDUCATION FILMS

Medical societies are frequently asked to recommend health education films suitable for showing to school and church groups. Motion pictures are also needed to be shown as presentations before civic groups at health fairs or at special events.

Write to the state office for your listing of selected motion pictures on health education subjects. Many films contain current information and can be obtained without charge (other than return postage).

Minnesota Blue Shield-Blue Cross

The Minnesota Blue Shield claims load continued to increase during the first eight months of 1959. Approximately 225,000 medical service reports were processed by Blue Shield during the first eight months of this year, an average of over 28,000 reports each month and a working day average of nearly 1,300 reports. Less than 10 per cent of these reports were ineligible for payment or were forwarded to other Blue Shield Plans, but even these claims required some processing.

Blue Shield payments to physicians during these eight months totaled $6,878,999. This figure is equal to monthly average payments of nearly $860,000 and far surpasses the total amount paid physicians in the same period of any previous year. During the first eight months of 1958 Blue Shield paid $6,476,003 for physicians services rendered participant subscribers or $402,996 less than was paid during the first eight months of 1959.

A total of 260,457 doctors' services were represented in Blue Shield payments from January 1 through August 31 of this year. This figure is 19,000 services greater than the number of services (241,458) which were provided Blue Shield benefits during the same eight months of 1958.

Minnesota Blue Cross hospitalization expense incurred during the first eight months of 1959 exceeded $25,1000,000, an increase of over $2,800,000 compared to hospitalization expense incurred during the same period of the previous year. This increase is a reflection of increased subscriber usage of Blue Cross benefits, hospital per diem costs and trend of the conversion of Blue Cross subscribers toward the higher benefit levels of coverage.

The 927,637 days of hospital care provided 147,691 Blue Cross subscribers and dependents during the first eight months of 1959 represented 3.2 days paid per year per 1,000 contracts protected, approximately 3.0 per cent over the 3.1 days per year per 1,000 contracts provided during the same period of the preceding year. The number of Blue Cross subscribers and dependents hospitalized and length of hospital stay incurred because of accidental injuries and neoplasms contributed the major portion of this increase in usage. It is interesting to note that through the first eight months, Blue Cross subscribers and dependents have been hospitalized because of diseases of the respiratory and digestive systems less frequently than during the same period of the preceding year.

CONGENITAL HEART DISEASE INVOLVING THE AORTIC VALVE

(Continued from Page 1578)

13. Swan, H., Wilkinson, R. H., and Blount, S. G., Jr.: Visual repair of congenital aortic stenosis during hypothermia. J. Thoracic Surg., 35:139, 1958.
14. Downing, D. F.: Congenital aortic stenosis: clinical aspects and surgical treatment. Circulation, 14:188, 1956.
15. Eggink, A. A., Hartog, P. A. Ph., and Kuipers, F.: Congenital aortic stenosis in young children. Am. Child. J. Dis., 95:170, 1958.
16. Bailey, C. P.: Surgery of the Heart. Philadelphia: Lea and Febiger, 1955.
17. Lillehei, C. W., Gott, V. L., DeWall, R. A., and Varco, R. L.: The surgical treatment of stenotic or regurgitant lesions of the mitral and aortic valves by direct vision, utilizing a pump oxygenator. J. Thoracic Surg., 35:154, 1958.
18. Brock, R., and Fleming, R. P.: Aortic subvalvular stenosis; a report of five cases diagnosed during life. Guy's Hospital Rep., London, 105:391, 1956.
19. Braverman, I. B., and Gibson, S.: The outlook for children with congenital aortic stenosis. Am. Heart J., 53:487, 1957.
20. Brock, R.: Functional obstruction of the left ventricle; acquired aortic subvalvular stenosis. Guy's Hospital Rep., London, 106:221, 1957.
21. Bercu, B. A., Diettert, G. A., Danforth, W. H., Pund, E. E., Ahlvin, R. C., and Belliveau, R. R.: Pseudoaortic stenosis, produced by ventricular hypertrophy; Am. J. Med., 25:814, 1958.
22. Morrow, A. G., and Braunwald, E.: Functional aortic stenosis. A malformation characterized by resistance to left ventricular outflow without anatomic obstruction; circulation, 20:181, 1959.
23. Derra, E., Kaiser, K., and Loogen, F.: Zur Klinik und Operativen Behandlung der Aortenklappenstenose. Deutsche Med. Wchnschr., 83:525, 1958.

Communications

A NEW EPIDEMIOLOGICAL STUDY OF CANCER

As reported in the July 11, 1959, issue of the *Journal of the American Medical Association,* the American Cancer Society is undertaking a large-scale study of cancer in relation to various environmental factors. Considering what is already known about causes of cancer in human beings, and considering the circumstances which led to their discovery, there is reason to suspect that many cases of cancer result from exposure to environmental factors not yet identified as carcinogenic for human beings. Once these factors are determined, there is hope of preventing the disease by reducing exposure to the responsible agents just as analine dye workers are now protected from exposure to beta naphythylamine to avoid the risk of bladder cancer.

One approach to the problem is to learn as much as possible about the environment, habits and family history of a very large number of people and then ascertain the later incidence of cancer in relation to these factors. By starting with a population of several hundred thousand people in all walks of life, the number of individuals falling into specific exposure groups should be sufficient to yield reasonably reliable cancer incidence rates. If any of these groups has an unusually high incidence of cancer at some specific site, then further studies can be undertaken to determine whether a direct causal relationship exists.

This is the basis for a new prospective epidemiological study being undertaken by the American Cancer Society under the direction of Dr. E. Cuyler Hammond, ACS Director of Statistical Research. It may be described briefly as follows:

Several hundred counties in 25 states, including Minnesota have been selected as study areas. The selection was made in such a way as to give a satisfactory geographic distribution. Cities of various sizes and types as well as rural areas will be included.

The plan is to enroll about 500,000 families nationwide of which about 20,000 families will be enrolled in Minnesota beginning on October 15, 1959. Volunteer workers of the Minnesota Division of the Society will be used to enroll families in which there is at least one person over the age of 45 and then request every member who is over the age of 30 to fill out a questionnaire. In order to keep the information confidential, each subject will put his filled-out questionnaire in an envelope and seal it before returning it to the volunteer for transmittal to the research center. The volunteers will not interview the subject and will not see the completed questionnaires.

The subjects will be followed annually for six years to determine which of them die in this interval. Causes of death will be ascertained from death certificates (not from the family). When cancer is mentioned on a death certificate, the physician who reported it will be requested to supply additional medical information (e.g., histologic type, stage of disease at time of diagnosis, etc.).

The major purpose of the study is to ascertain the association, if any, between various environmental factors (such as occupational exposures, habits, diet, factors related to the breast and female genital organs, etc.) and the later occurrence of cancer. It is hoped that this will yield clues as to a number of possible causes of cancer.

In addition, it is hoped that the study will provide information of value in relation to lay education. The subjects are asked detailed questions about "present physical complaints" and the answers will be analyzed in relation to cases of cancer diagnosed in the subsequent several months. In order to avoid biasing the subjects, questions are asked about physical complaints which are probably not related to cancer as well as about complaints which may be symptomatic of cancer. Assuming, as is probable, that positive answers to certain of these questions are highly related to the presence of cancer, the data later should be of value in persuading people with such complaints to see their doctor immediately. The aim, of course, is to reduce the factor of "patient delay" in the diagnosis of cancer.

FRANCIS W. LYNCH, M.D.

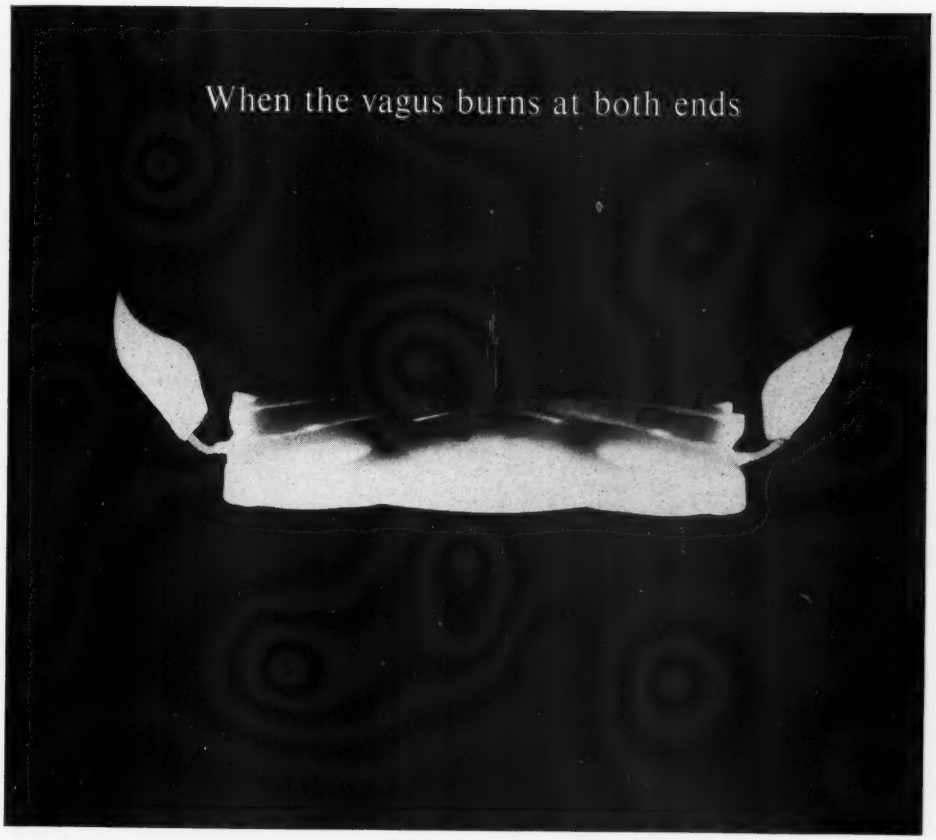
This Section is for you to voice your convictions, comments, and queries on all subjects political, economic, historic, humorous, scientific or otherwise, to many physicians. Writings not sufficiently formal and too brief for an editorial or a scientific manuscript are requested. Clinical and research observations, no matter how brief, similar to those in *The Lancet* (London), are particularly encouraged.

THE TUMOR REGISTRY

The value of the Tumor Registry maintained at each local hospital in Duluth has been questioned by many physicians. The criticism that the treatment of cancer is not influenced by these data may be valid at the present time. However, in spite of incomplete records, variations in therapeutic methods between physicians, patients lost to follow-up, et cetera, the future value of these data may be beyond our ken. The most pessimistic critics of the Tumor Registry state that our present methods of treatment fail to alter the course of carcinoma of the stomach, breast and lung. This latter objection, if true, suggests one fundamental series of observations not now available: the natural history of cancer in various organs.

Unless the most optimistic physicians envision a lytic agent which will destroy all malignant cells and omnisciently spare the normal, then future life-saving methods of cancer therapy will require a base line of experience against which the value of each agent may be measured. If each local Tumor Registry can contribute to such a base line of experience and document the natural history of malignant disease, then these data alone should be ample justification for the careful collection and tabulation of each cancer case by the Tumor Registry method.

J. V. THOMES, M.D.



Pro-Banthine® with Dartal® moderates both mood and gastrointestinal spasm

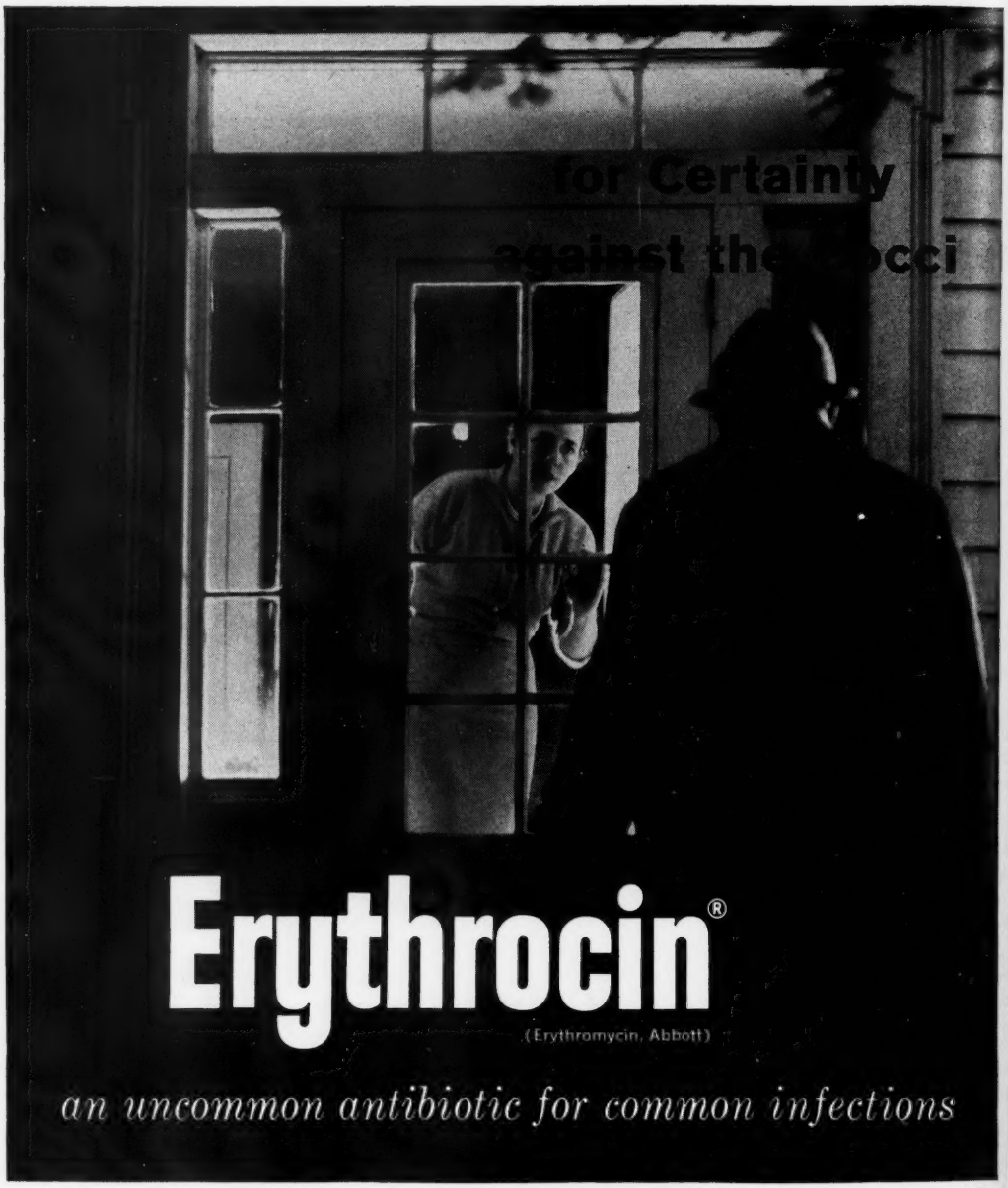
The slow simmer of anxiety frequently causes kindred gastrointestinal overactivity. The spasticity and the accompanying distress of excess acid lead to loss of efficiency. Patients subject to such psychoenteric upsets require therapy to calm both ends of the vagus.

Pro-Banthine with Dartal contains two agents required for such dual therapy: Pro-Banthine to control and curtail the flare-ups of spasm, excess acidity and excess motility, and Dartal to smother simmering anxiety and tension.

Pro-Banthine with Dartal contains 15 mg. of Pro-Banthine (brand of propantheline bromide) and 5 mg. of Dartal (brand of thiopropazate dihydrochloride) in each tablet.

Dosage: One tablet three times a day.

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Research in the Service of Medicine.



Provides fast, high blood and tissue concentrations—plus an unparalleled safety record. Erythrocin is available in easy-to-swallow Filmtabs® (100 and 250 mg.); in tasty, citrus-flavored Oral Suspension (200 mg. per 5-cc. teaspoonful); and for intravenous and intramuscular use.

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CONVENIENCE and ECONOMY

for that all-important first dose of broad-spectrum antibiotic therapy

New

TERRAMYCIN®

brand of oxytetracycline

INTRAMUSCULAR SOLUTION



Initiation of therapy in *minutes after diagnosis* with new, ready-to-inject Terramycin Intramuscular Solution provides maximum, sustained absorption of potent broad-spectrum activity.

...and for continued, compatible, coordinated therapy

COSA-TERRAMYCIN®

oxytetracycline with glucosamine

CAPSULES

Continuation with oral Cosa-Terramycin every six hours will provide highly effective antibacterial serum and tissue levels for prompt infection control.

The unsurpassed record of clinical effectiveness and safety established for Terramycin is your guide to successful antibiotic therapy.

Supply:

*Terramycin Intramuscular Solution**
100 mg./2 cc. ampules
250 mg./2 cc. ampules

Cosa-Terramycin Capsules
125 mg. and 250 mg.

Cosa-Terramycin is also available as:
Cosa-Terramycin Oral Suspension — peach flavored, 125 mg./5 cc., 2 oz. bottle
Cosa-Terramycin Pediatric Drops — peach flavored, 5 mg./drop (100 mg./cc.), 10 cc. bottle with plastic calibrated dropper

Complete information on Terramycin Intramuscular Solution and Cosa-Terramycin oral forms is available through your Pfizer Representative or the Medical Department, Pfizer Laboratories.

*Contains 2% Xylocaine® (lidocaine), trademark of Astra Pharmaceutical Products, Inc.

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PFIZER LABORATORIES, Division, Chas. Pfizer & Co., Inc., Brooklyn 6, N. Y.

Meetings and Announcements

INTERNATIONAL

Second Bahamas Surgical Conference, British Colonial Hotel, Nassau, Bahamas, December 28, 1959 until January 16, 1960.

International College of Surgeons, Twelfth Biennial International Congress, Rome, Italy, May 15-18, 1960.

Fourth International Goiter Conference, July 5-9, 1960, London, England, under the auspices of the London Thyroid Club and the American Goiter Association. Application blanks are available from John C. McClintock, M.D., 149½ Washington Avenue, Albany 10, New York, U.S.A.

Pan American Medical Association Congress, Mexico City, Mexico, May 2-11, 1960. For further information, write Dr. Joseph J. Eller, Director General, 745 Fifth Avenue, New York, New York.

International Congress of Gastroenterology, sixth meeting, Leyden, Netherlands, April 20-24, 1960. Patron: His Royal Highness the Prince of the Netherlands.

Third International Congress of Physical Medicine, Washington, D. C., August 21-26, 1960.

Second International Symposium on Changing Concepts in Medicine (Congenital Heart Disease), Bellevue-Stratford Hotel, Philadelphia, Pennsylvania, April 28, 29, 30, 1960. For further information write Doctor Charles P. Bailey, The Deborah Hospital, Browns Mills, New Jersey, or Doctor Charles P. Bailey, Deborah National Office, 901 Walnut Street, Philadelphia 7, Pennsylvania.

NATIONAL

American Medical Association Clinical Session, Dallas, Texas, December 1-4, 1959.

The Biophysical Society, Fourth Annual Meeting, Sheraton Hotel, Philadelphia, Pennsylvania, February 24-26, 1960. For further information write to H. P. Schwan, Chairman, Local Arrangements, University of Pennsylvania, Philadelphia 4, Pennsylvania, or to O. H. Schmitt, Chairman, Program Committee, University of Minnesota, Minneapolis 14, Minnesota.

American College of Allergists Graduate Instructional Course and Annual Congress, The Americana Hotel, Bal Harbour, Miami Beach, Florida, February 28-March 4, 1960. For further information, write John D. Gillaspie, M.D., Treasurer, 2049 Broadway, Boulder, Colorado.

National Society for Crippled Children and Adults, Annual Convention, November 29-December 2, 1959, Palmer House, Chicago. For further information, write Miss Catharine Bauer, Director of Information, 2023 West Ogden Avenue, Chicago 12, Illinois.

National Conference on the Medical Aspects of Sports, sponsored by the American Medical Association, November 30, 1959, Dallas, Texas, immediately preceding the AMA Clinical Meeting, December 1-4.

Third Annual Oklahoma Colloquy on Advances in Medicine, University of Oklahoma Medical Center, Oklahoma City, March 24-26, 1960.

Eighth Postgraduate Course in Diabetes and Basic Metabolic Problems, American Diabetes Association, Ambassador Hotel, Los Angeles, California, January 20-22, 1960.

The Twenty-third Annual Meeting of the New Orleans Graduate Medical Assembly, headquarters at the Roosevelt Hotel, New Orleans, Louisiana, March 7, 8, 9, and 10, 1960.

The Eleventh Annual Symposium on Recent Advances in the Study of Venereal Diseases, Palmer House, Chicago, Illinois, April 7 and 8, 1960.

STATE

The following medical continuation courses will be presented at the center for continuation study, University of Minnesota: January 11-13, 1960, Ophthalmology for Specialists; and January 21-23, 1960, Surgery for Surgeons. For further information write, Director, Department of Continuation Medical Education, 1342 Mayo Memorial, University of Minnesota, Minneapolis 14, Minnesota.

MINNESOTA ACADEMY OF OCCUPATIONAL MEDICINE AND SURGERY

Officers for the Minnesota Academy of Occupational Medicine and Surgery for 1959 and 1960 are as follows: Dr. John A. Williams, St. Paul, President; Dr. Robert W. Goltz, Minneapolis, Vice President; Dr. Earl T. Opstad, Minneapolis, Secretary; Dr. B. I. Derauf, St Paul, Treasurer; Dr. Davitt Felder, St. Paul, Recorder.

EYES IN INDUSTRY COURSE ANNOUNCED

The Institute of Industrial Health of the University of Cincinnati announces a course of instruction in *Industrial Eye Problems* will be given during the week of January 18-22, 1960. It will be presented by the Institute of Industrial Health in cooperation with the Department of Ophthalmology.

Current concepts regarding vision requirements for specific job categories will be discussed. Eye examination procedures and vision screening devices will be demonstrated. Opportunity for informal discussion of practical problems will be provided.

Physicians interested in attending the course should write for an application blank to: A/60, Institute of Industrial Health, Kettering Laboratory, Eden and Bethesda Avenues, Cincinnati 19, Ohio. The registration fee will be $100.

(Continued on Page 1656)

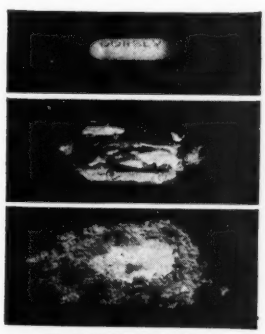
MAINTENANCE THERAPY WITHOUT STEROIDS IS FUNDAMENTAL

Sound, conservative therapy with salicylates has been consistently reaffirmed as basic, long-term maintenance therapy in the arthritides.

Buffered Pabirin provides superior maintenance therapy. It epitomizes fundamental long-term basic therapy since it can be given month after month without serious complications and with minimal problems to patient and doctor alike.

Buffered Pabirin is formulated to provide high and sustained salicylate blood levels. Each tablet consists of an outer layer containing a buffer (aluminum hydroxide), para-aminobenzoic acid, and ascorbic acid; a core of acetylsalicylic acid.

In the stomach, the outer layer quickly releases the buffer, which protects against nausea, dyspepsia and other gastrointestinal symptoms so frequently encountered with salicylates alone. The core of Buffered Pabirin then disintegrates rapidly, permitting rapid absorption of the acetylsalicylic acid for faster pain relief.



Photographs show 2-stage Tandem Release disintegration.

Each tablet contains:
Acetylsalicylic acid (5 gr.).....300 mg.
Para-aminobenzoic acid (5 gr.)....300 mg.
Ascorbic acid ..... 50 mg.
Dried aluminum hydroxide gel....100 mg.

All Buffered Pabirin is sodium- and potassium-free.

Dosage: Two or three tablets 3 or 4 times daily.

References: 1. Hart, D.; Bagnall, A. W.; Bunim, J. J., and Polley, F. H.: Ninth International Congress on Rheumatic Diseases, Toronto, Ont. (June 25) 1957. 2. Report of Joint Committee, Medical Research Council & Nuffield Foundation, Treatment of Rheumatoid Arthritis, British Medical Journal (April 13) 1957. 3. Friend, D. G.: New England J. Med. 257:278 (Aug.) 1957.

Buffered **Pabirin®** *Tablets*

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(Continued from Page 1652)

PRIZE ESSAY CONTEST FOR MEDICAL STUDENTS ANNOUNCED

The American College of Chest Physicians is offering three cash awards to winners of the 1960 Prize Essay Contest. First prize, $500.00—second prize, $300.00—third prize, $200.00. Each winner will also receive a certificate.

The contest is open to *undergraduate* medical students throughout the world. Essays may be written on any phase of the diagnosis and treatment of chest diseases (cardiovascular or pulmonary).

The contest closes on April 1, 1960. For application and further information, please write: American College of Chest Physicians, 112 East Chestnut Street, Chicago 11, Illinois.

FELLOWSHIPS FOR STUDY OF ARTHRITIS AND RELATED DISEASES

The National Foundation announces the availability of fellowships for clinical study in arthritis and related diseases for physicians who have an interest in rheumatic diseases and who intend to apply their knowledge of these diseases to clinical service, teaching, or research.

Only physicians, licensed, or eligible for licensure, to practice in the United States and who have had at least two years of specialty training acceptable to the appropriate American Board (or equivalent training) are eligible. All applicants must be United States citizens.

Financial support for the Fellow is $4,500.00 a year with $540.00 allowed annually for each dependent. Annual increases of $480.00 are ordinarily granted. Under unusual circumstances higher stipends may be permitted. For a full academic program, complete tuition and fees are paid; for other programs, a sum not to exceed $1,250.00 including tuition may be arranged.

Applications must be received by:

February 1 for consideration approximately May 1, 1960.

August 1 for consideration approximately November 1, 1960.

November 1 for consideration approximately February 1, 1961.

The National Foundation has authorized the expenditure of $33,400,000 since 1938 for professional education.

For further information, write to: Division of Scholarships and Fellowships Department of Professional Education, The National Foundation, 800 Second Avenue, New York 17, New York.

NEW PUBLICATION

The Society of Nuclear Medicine, 430 North Michigan Avenue, Chicago 11, Illinois, is pleased to announce the forthcoming publication of its official organ, *The Journal of Nuclear Medicine*. The first quarterly issue will appear during the month of January, 1960.

(Continued on Page 1658)

Annual Clinical Conference

CHICAGO MEDICAL SOCIETY

March 1, 2, 3 and 4, 1960

Palmer House, Chicago

Daily Half-Hour Lectures by Outstanding Teachers and Speakers on subjects of interest to both general practitioner and specialist.

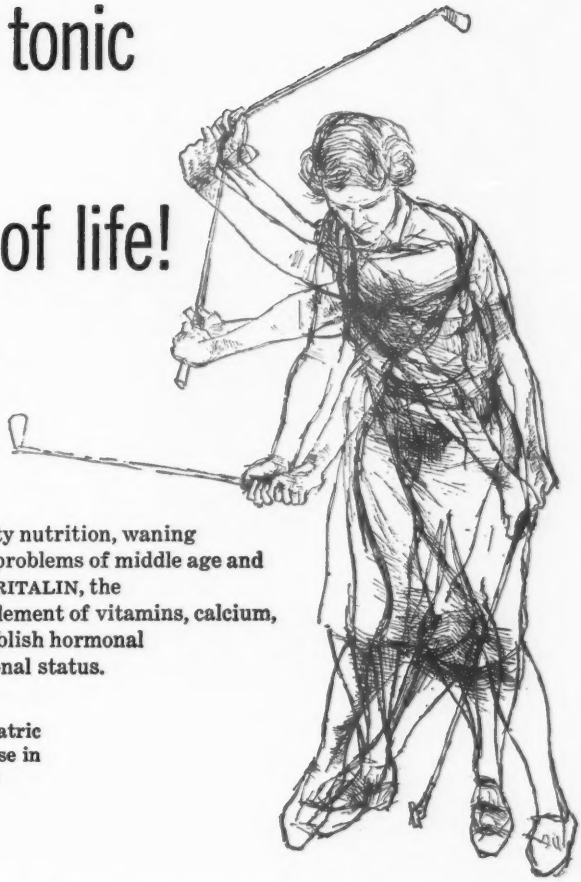
Panels on Timely Topics — **Teaching Demonstrations**

Medical Color Telecasts — **Instructional Courses**

Scientific Exhibits worthy of real study and helpful and time-saving Technical Exhibits.

The Chicago Medical Society Annual Clinical Conference should be a MUST on the calendar of every physician. Plan now to attend and make your reservations at the Palmer House.

New revitalizing tonic brightens the second half of life!



Ritonic™

A sense of frustration and inadequacy, faulty nutrition, waning gonadal function—RITONIC meets all these problems of middle age and senile let-down. The unique combination of RITALIN, the *safe* central stimulant, with a balanced complement of vitamins, calcium, and hormones acts to renew vitality, re-establish hormonal and anabolic benefits, and improve nutritional status.

"We found Ritonic to be a safe, effective geriatric supplement . . ."[1] "Patients reported an increase in alertness, vitality and sense of well being."[2]

PRESCRIBE RITONIC

for your geriatric patients, your middle-aged patients and your postmenopausal patients.

Each Ritonic Capsule contains:

Ritalin® hydrochloride	5 mg.
methyltestosterone	1.25 mg.
ethinyl estradiol	5 micrograms
thiamin (vitamin B_1)	5 mg.
riboflavin (vitamin B_2)	1 mg.
pyridoxin (vitamin B_6)	2 mg.
vitamin B_{12} activity	2 micrograms
nicotinamide	25 mg.
dicalcium phosphate	250 mg.

Remember
SERPASIL®
(reserpine CIBA)
for the anxious hypertensive with or without tachycardia

Dosage: One Ritonic Capsule in mid-morning and one in mid-afternoon.
Supplied: Ritonic CAPSULES; bottles of 100.
References: 1. Natenshon, A. L.: J. Am. Geriatrics Soc. *6*:534 (July) 1958.
2. Bachrach, S.: To be published.
RITALIN® hydrochloride (methylphenidate hydrochloride CIBA)

CIBA SUMMIT, N. J.

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TUCKS®

soft cotton flannel pads saturated with witch hazel (50%) and glycerine (10%). pH about 4.6

answers a dermatologic and an emotional need

Cleansing, solvent, mildly astringent TUCKS provides a new and valuable therapeutic aid for the treatment of acne.

At home in their handy jars, or *at school* in the moisture-tight plastic envelope provided, soothing Tucks pads promote the thorough skin care indispensable to the successful treatment of acne.

Always ready for use, TUCKS encourages cleanliness when used as finger shields for expressing comedones.

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Minneapolis 16, Minn.

For a generous office supply of TUCKS —just fill in and return this card.

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(Continued from Page 1656)

TV SHOW ABOUT HUMAN SENSES

What science has learned about the operation of the human senses will be seen again on television Sunday afternoon, December 6, at 5:00 p.m., on KSTP-TV Twin Cities, when "Gateways to the Mind" on the Bell System Science Series will be given a repeat telecast over NBC-TV. Viewers in other areas are advised to consult local program listings. The program was first seen on October 23, 1958.

With Professor Frank C. Baxter of the University of Southern California as narrator, the hour-long program uses both documentary film and animation to explain the functions of the sense organs and their connections with the brain. The program is presented in both color and black and white.

Of particular interest to the medical profession is the guest appearance of Dr. Wilder Penfield, McGill University surgeon, to show his experiments in eliciting sensation by direct stimulation of brain areas.

Dr. Hadley Cantril, Princeton University psychologist, appears on the program to explain his experiments in illusions. Experiments in the deprivation of sensory stimulation are also shown.

"Gateways to the Mind" was produced under the technical supervision of Dr. George Wald, professor of biology at Harvard, and Dr. Frederick Crescitelli, professor of zoology at UCLA, and an advisory board of ten leading American scientists.

Bell Telephone Companies throughout the country are making the program available on 16-mm. color film for showings to interested groups.

ASIA-PACIFIC ACADEMY OF OPHTHALMOLOGY

The First Congress of the Asia-Pacific Academy of Ophthalmology will be held in Manila, Philippines, from October 10 to 13, 1960, under the sponsorship of the Philippine Ophthalmological Society. This will be participated in by delegates from different countries of the Asia-Pacific regions and also by guests from the Americas and Europe. Its main theme will be: "Blinding Diseases of the Asia-Pacific Regions."

The Committee on Scientific Program has set February, 1960, as the deadline for the submission of titles of free papers (with brief abstracts of 200 words) and Medical Films, so that these can be included in the official program of the Congress. In addition to these papers and films, there will also be Guest Lectures by prominent ophthalmologists from America, Australia, Europe and India.

For registrations or further particulars, kindly communicate with Dr. Jesus V. Tamesis, Executive Chairman, 42 Quezon Blvd., Quezon City, Philippines.



running noses and open stuffed noses orally

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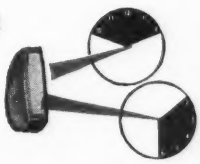
the leading oral nasal decongestant

- in nasal and paranasal congestion
- in sinusitis
- in postnasal drip
- in allergic reactions of the upper respiratory tract.

safer and more effective than topical medication[1,2,3]

- systemic transport to all respiratory membranes
- provides longer-lasting relief
- presents no problem of rebound congestion
- avoids "nose drop addiction"

Relief with Triaminic is prompt and prolonged because of this special timed-release action . . . beneficial effect starts in minutes, lasts for hours



first—the outer layer dissolves within minutes to produce 3 to 4 hours of relief

then—the core disintegrates to give 3 to 4 *more* hours of relief

Each TRIAMINIC Tablet provides:
Phenylpropanolamine HCl .....50 mg.
Pheniramine maleate .....25 mg.
Pyrilamine maleate .....25 mg.

One-half of this formula is in the outer layer, the other half is in the core.

Dosage: One tablet in the morning, mid-afternoon and at bedtime.

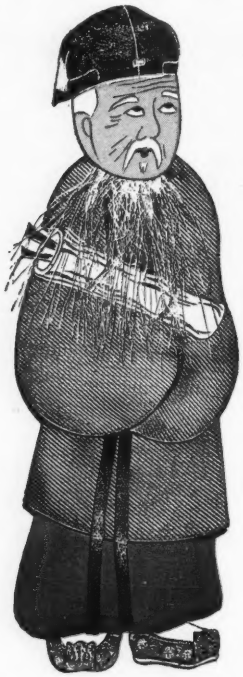
References: 1. Lhotka, F. M.: Illinois M. J. 112: 259 (Dec.) 1957. 2. Fabricant, N. D.: E.E.N.T. Monthly 37:460 (July) 1958. 3. Farmer, D. F.: Clin. Med. 5:1183 (Sept.) 1958.

TRIAMINIC JUVELETS: Each timed-release Juvelet is equivalent in formula and dosage to one-half of a TRIAMINIC tablet, for the adult or child who requires only half strength dosage.

TRIAMINIC SYRUP is recommended for adults and children who prefer liquid medication. Each 5 ml. tsp. is equivalent to ¼ of a Triaminic Tablet. *Adults:* 2 tsp. 3-4 times a day; *children 6-12:* 1 tsp. 3-4 times a day; *children under 6:* in proportion.

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immortals of chinese mythology:



Chang Kuo-lao

This itinerant sage impressed the court of the Emperor by growing a new set of teeth

...this potent corticosteroid has impressed the medical profession with its repeated success in countless steroid-responsive indications

METICORTEN

METICORTEN,® brand of prednisone, 5 mg. tablets.

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You will soon receive in your mail a full-color, handmade, three-dimensional figure of this Chinese Immortal, mounted and suitable for framing.

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Schering

Woman's Auxiliary

ST. LOUIS COUNTY AUXILIARY

Nursing Scholarships

The St. Louis County Medical Auxiliary has awarded $400 in scholarships this Fall to assist three girls in their nurses' training.

Miss Frances Horvath, 709 12th St. No., Virginia, Minnesota, of the College of St. Scholastica, Department of Nursing, St. Mary's Hospital, Duluth, Minnesota, is the recipient of a $200 scholarship. Twin sisters, Miss Judith and Miss Janith Aili, 822 Celia Street, Ironwood, Michigan, St. Luke's Hospital School of Nursing, Duluth, Minnesota, each received $100.

Dinner Dance

On September 19, the Auxiliary honored their husbands at a Dinner-Dance at the Kitchi Gammi Club. The decorations centered around the forthcoming hunting season, and the gold-painted duck decoys used as table centerpieces were auctioned off to raise a sizable amount for the A.M.E.F.

Membership Tea

The Annual Membership Tea was held on Tuesday, October 13, at the home of Mrs. John F. Schmid. All members, prospective members, and wives of residents and interns were invited to attend.

Northern Minnesota Medical Association Meeting

The wives of doctors attending the Northern Minnesota Medical Association Meeting in Duluth on September 11 were entertained by the local Auxiliary with luncheon at the Kitchi Gammi Club and a tour of the Skyline Drive, the new Port Terminal Building, and other points of interest in the harbor. The theme of the Seaway was carried out in the table decorations and favors.

Mrs. M. F. Fellows, the State Auxiliary President, was a guest speaker. Mrs. John Haavik is president of the St. Louis County Auxiliary and Mrs. Josiah Fuller was Chairman for the women's events.

RAMSEY COUNTY AUXILIARY

The Fall Style Show was both a financial and social success, due to the efforts of committees under Mrs. Phil Roy and Mrs. B. G. Lannin.

Mrs. Hanns Schwyzer, President, entertained Board members at a luncheon in her home in September. Plans were formulated for a tea to be given by the Auxiliary for their members at the home of Doctor and Mrs. Gordon Kamman, on November 19. Past Presidents will be guests of honor.

Many members have taken advantage of the training sessions offered by the Red Cross National Blood Program. Mrs. Charles Froats and Mrs. E. R. Sterner are chairmen of this main project for the coming year.

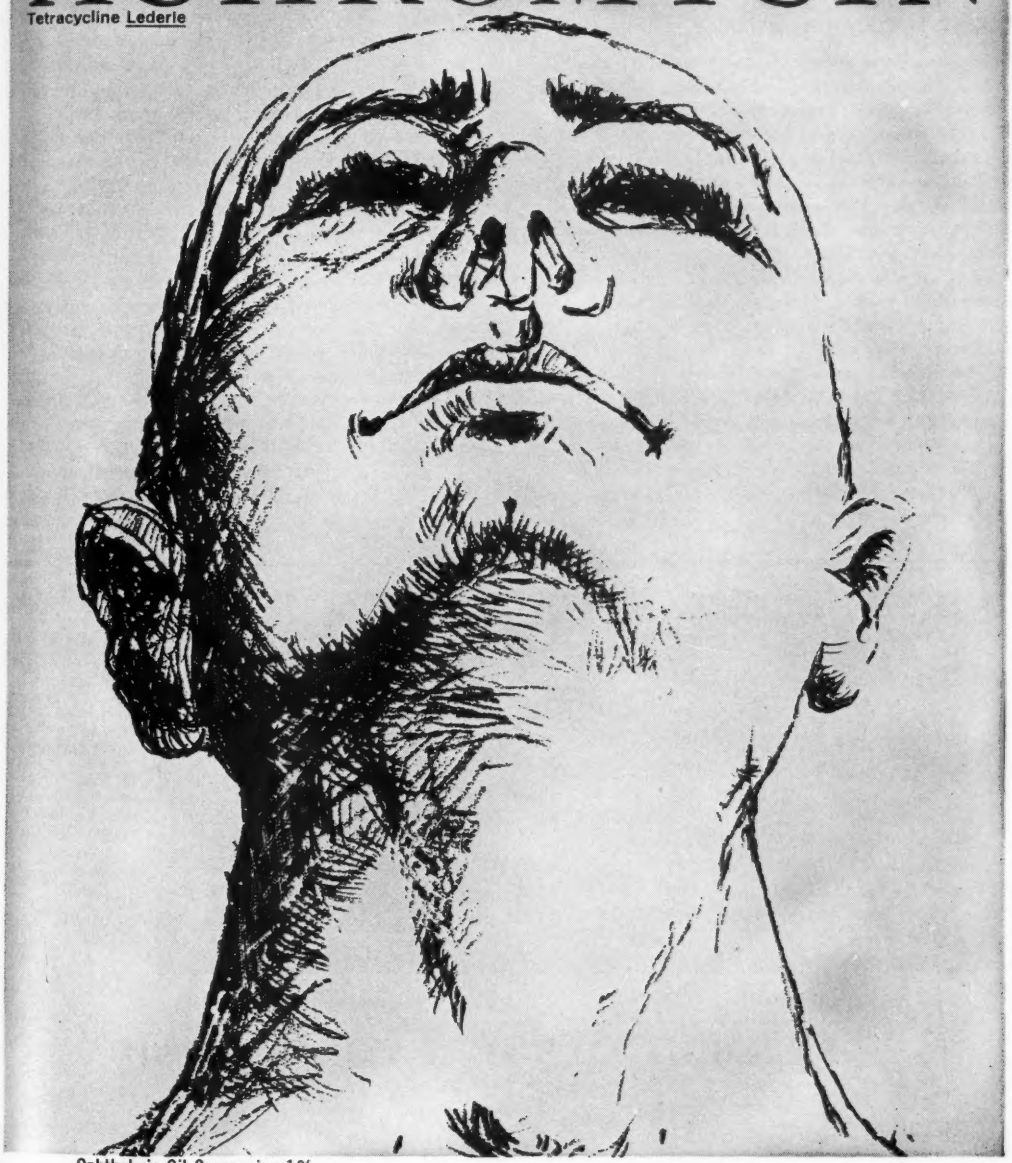
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internal and/or external attack

Whatever the bacterial infection seen in EENT, the foci respond rapidly to a suitable form of broad-spectrum ACHROMYCIN. In superficial cases, local therapy is often dramatic. In deep-seated conditions, ACHROMYCIN V capsules complement topical control for fast relief and remission.

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e Ophthalmic Oil Suspension 1%
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Ophthalmic Ointment 1%
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with Hydrocortisone
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ACHROMYCIN V (Tetracycline with Citric Acid) Capsules

LEDERLE LABORATORIES, a Division of AMERICAN CYANAMID COMPANY, Pearl River, New York

RAMSEY COUNTY AUXILIARY

(Continued from Page 1660)

Mrs. Ralph Olsen, Cancer society representative, introduced Mrs. Helen Barlow at the October Board meeting. Mrs. Barlow explained the Cancer Research questionnaire which is being started by the National Cancer Society.

STUDENT MEDICAL AUXILIARY

A welcome tea in honor of new members of the Student Medical Auxiliary was held October 25 from 3 to 5 p.m. in Coffman Union, University of Minnesota. Mrs. James Knapp, 6005 W. 35th Street, Minneapolis, state chapter president, presented the welcome.

Special guests included Mrs. M. F. Fellows, state president of the Woman's Auxiliary; Mrs. Frederick Gunlaugson, president of the Hennepin County Woman's Auxiliary; and Mrs. Hans C. Schwyzer, president of the Ramsey County Woman's Auxiliary.

Responsibilities of a doctor's wife were discussed at the November 10 meeting at the home of Dr. and Mrs. C. D. Creevy, 1633 E. River Road, Minneapolis.

The December 8 meeting will be held at the home of Dr. and Mrs. William D. Nesset, 5528 Merritt Circle, Minneapolis. The program will be devoted to making Christmas decorations for homes for the aged.

On December 18 and 19, a rummage sale will be held at 810 S. 10th Street, Minneapolis, with proceeds going to the scholarship fund.

ZUMBRO VALLEY AUXILIARY DISCUSSES RESPONSIBILITIES OF PHYSICIANS' WIVES

Four members of the Zumbro Valley Medical Society Auxiliary recently told 160 wives of Fellows in the Mayo Foundation about the role of the physician's wife in the community and on the "home front."

Mrs. James W. DuShane, moderator, Mrs. Earl C. Elkins, Mrs. Howard P. Rome, and Mrs. Charles F. Stroebel gave a panel discussion, "So You Married a Doctor," at the first meeting of the fall season of the Fine Arts Section of the Magazine Club at the Foundation House.

Using their own experiences as examples, the doctors' wives gave advice.

"Don't spread yourself too thin," was one suggestion. Most communities turn for help to doctors' wives in organizing work on health problems and children's projects. Don't join so many groups you haven't time left for this important aspect of community giving, the panelists cautioned.

Many valuable experiences may be gained by joining church groups first, the speakers said. They agreed that with the time limitations imposed by a doctor's long hours, his wife should never allow community projects to precede her family responsibilities.

The "home front" atmosphere should be one of creativity, with flexible schedules allowing for quiet hours, as well as for family sharing of activities.

A coffee hour preceded the program. Hostesses were Mrs. William M. Michener, chairman, Mrs. F. Richard Dion, Mrs. Ralph B. Johnson, and Mrs. Samuel Weisz.



A MODERN PRIVATE SANITARIUM

for the Diagnosis, Care and Treatment of Nervous and Mental Disorders

MAIN BUILDING—One of 8 Units in "Cottage Plan"

ST. CROIXDALE ON LAKE ST. CROIX

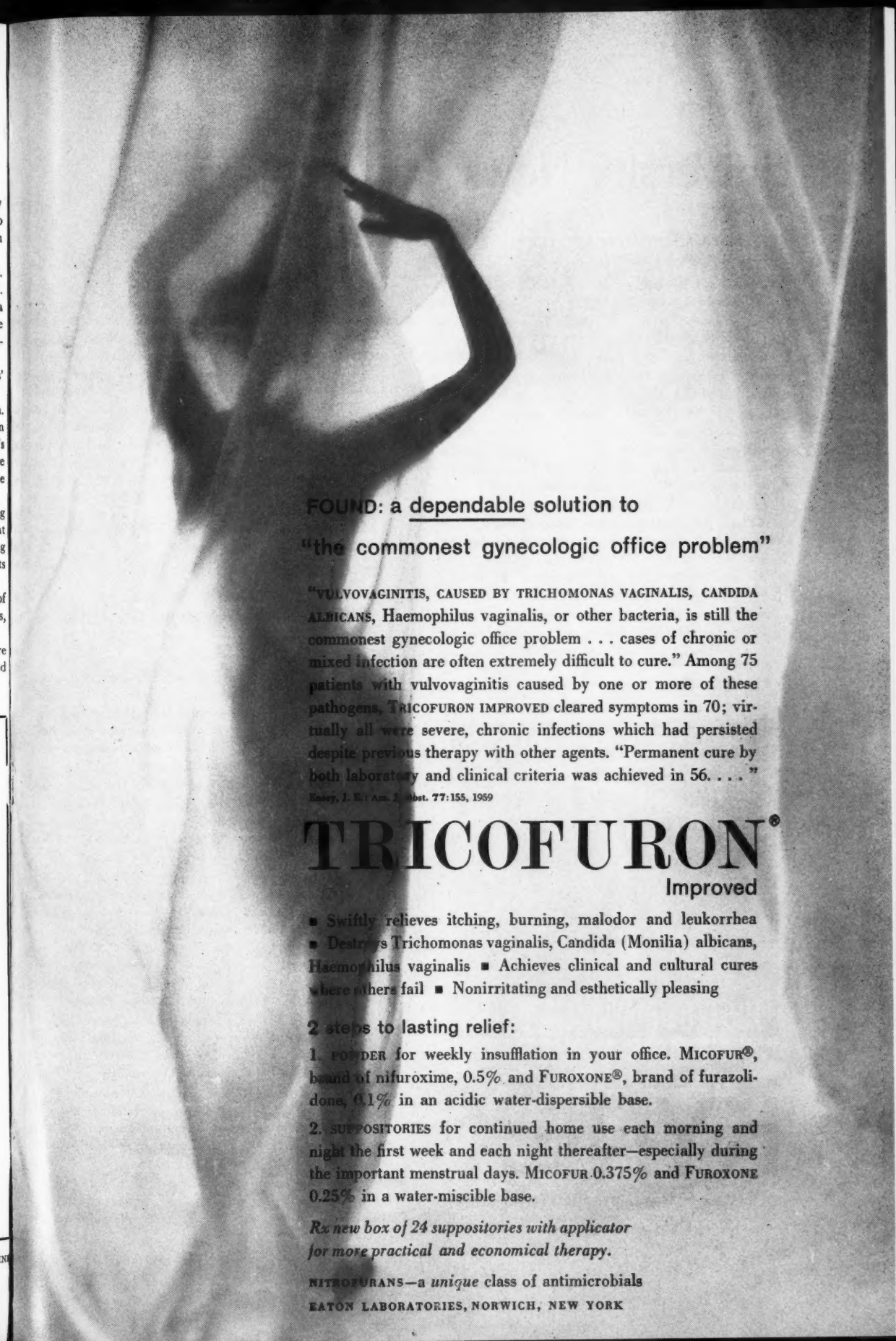
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Located on beautiful Lake St. Croix, 18 miles from the Twin Cities, it has the advantages of both City and Country. Every facility for treatment provided, including recreational activities and occupational-therapy under trained personnel. Close personal supervision given patients, and modern methods of therapy employed. Inspection and cooperation by reputable physicians invited. Rates very reasonable. Special rates given to custodial patients.

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FOUND: a dependable solution to "the commonest gynecologic office problem"

"VULVOVAGINITIS, CAUSED BY TRICHOMONAS VAGINALIS, CANDIDA ALBICANS, Haemophilus vaginalis, or other bacteria, is still the commonest gynecologic office problem . . . cases of chronic or mixed infection are often extremely difficult to cure." Among 75 patients with vulvovaginitis caused by one or more of these pathogens, TRICOFURON IMPROVED cleared symptoms in 70; virtually all were severe, chronic infections which had persisted despite previous therapy with other agents. "Permanent cure by both laboratory and clinical criteria was achieved in 56. . . . "

Essey, J. E.: Am. J. Obst. 77:155, 1959

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Improved

■ Swiftly relieves itching, burning, malodor and leukorrhea ■ Destroys Trichomonas vaginalis, Candida (Monilia) albicans, Haemophilus vaginalis ■ Achieves clinical and cultural cures where others fail ■ Nonirritating and esthetically pleasing

2 steps to lasting relief:

1. POWDER for weekly insufflation in your office. MICOFUR®, brand of nifuroxime, 0.5% and FUROXONE®, brand of furazolidone, 0.1% in an acidic water-dispersible base.

2. SUPPOSITORIES for continued home use each morning and night the first week and each night thereafter—especially during the important menstrual days. MICOFUR 0.375% and FUROXONE 0.25% in a water-miscible base.

Rx new box of 24 suppositories with applicator for more practical and economical therapy.

NITROFURANS—a *unique* class of antimicrobials

EATON LABORATORIES, NORWICH, NEW YORK

University News

MINNESOTA MEDICAL FOUNDATION SCHOLARSHIP AWARDED

Twenty-six University of Minnesota medical students won scholarships totalling $13,250 from the Minnesota Medical Foundation for the 1959-60 academic year. Most were for $500.00 each.

The awards, said Dr. Herman E. Drill, Foundation President, brought to $93,500 the total amount given to medical students in scholarships during the past eleven years. There have been 183 separate awards.

The scholarships were conferred at Minnesota Medical Foundation Day exercises September 28 held in conjunction with the opening of the Seventy-first academic year of the University of Minnesota medical school.

Dean Theodore C. Blegen of the University's Graduate School delivered the main address titled "Some Thoughts on the Nature and Meaning of Scholarship." He was introduced by Dr. Wesley W. Spink, former Foundation President and now Professor of Medicine at the medical school.

Dr. J. Arthur Myers, Professor Emeritus at the University's School of Public Health and career tuberculosis fighter, was awarded the Outstanding Achievement Award, highest honor given by the Board of Regents. Doctor Robert B. Howard, Dean of the College of Medical Sciences, conferred the award.

Recipients of Foundation scholarships, some designated by the name of sponsoring organization were: David S. Hopkins, St. Paul, Senior; Michael F. Koch (Minneapolis Guild of Catholic Physicians), Wadena, Senior; Kenneth P. Manick (Minneapolis Gas Company), Minneapolis, Senior; John A. Cich (Modern Medicine), Minneapolis, Junior; Walter D. Cunningham (Minnesota Academy of General Practice), Sturgeon Lake, Junior; Nancy Jo Engeset (Western Oil and Fuel Company), Minneapolis, Junior; James C. Guthrie, St. Paul, Junior; John B. Leary (Minnesota Academy of Medicine), St. Paul, Junior; Robert E. Olson (Erling S. Platou, Nu Sigma Nu), Minneapolis, Junior; and Jonathan A. Parsons (Minneapolis Academy of General Practice), Minneapolis, Junior.

Expansion Plans Announced

Plans for expanding its fund raising and alumni relations programs have been announced by the head of the Minnesota Medical Foundation.

Dr. H. E. Drill, Hopkins, said the Foundation has completed plans to enlist more members and more funds to step up its services to the school. The Foundation, he said, will open its door to greater membership from the general public and will seek the active support of the University's 5,700 medical alumni.

Established in 1939 by medical faculty leaders and alumni, the Foundation now lists 1,200 members and in its first decade has distributed nearly 200 scholarships to medical students, sponsored lectures, published research papers, and held health forums for the public.

In the future, Doctor Drill said, the Foundation will (1) publish reports on the achievements, objectives and needs of the medical school; (2) seek to double its membership; (3) afford specialized liaison services to the school; (4) publish a redesigned version of the University's Medical Bulletin; and (5) work closely with University authorities and the Minnesota Medical Alumni association in fostering close alumni relations.

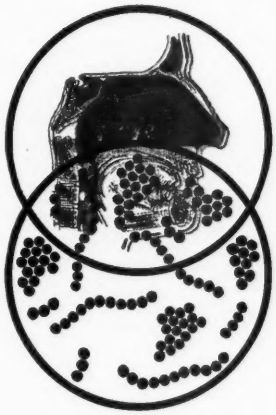
Eivind Hoff, Jr., newly named the first Executive Secretary in Foundation history, pointed out that plans for future activities were drawn from a survey of needs published by the medical school last winter.

The report detailed such needs as scholarships for medical students; recognition of outstanding teaching or research by faculty members; fundamental research support, building projects and medical student recruitment.

"Planned programs in areas will help the medical school maintain its high rank in medical education," Hoff said. "This is to be the Foundation's major single objective."



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when upper respiratory congestion is complicated by bacterial invaders

TRISULFAMINIC provides logical therapy

- for the patient ill with congestion and infection of the upper respiratory tract, as in purulent rhinitis, sinusitis, tonsillitis and otitis media, when caused by sulfa-susceptible bacteria;
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Dosage:

Adults—2 to 4 tablets or tsp. initially, followed by 2 tablets or tsp. every 4 to 6 hours until the patient has been afebrile 3 days. *Children 8 to 12* — 2 tablets or tsp. initially, followed by 1 tablet or tsp. every 6 hours. *Children under 8*—dosage according to weight.

The palatability, convenience and effectiveness of the Suspension make it especially suitable for children and for those older patients who prefer liquid medication.

References: 1. Cecil, R. L., et al.: J.A.M.A. 124:8 (Jan. 1) 1944. 2. Fabricant, N. D.: E.E.N.T. Monthly 37:460 (July) 1958. 3. Beckman, H.: Drugs, Their Nature, Action & Use, Saunders, Philadelphia, 1958, p. 527.

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MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

ROSEAU COUNTY HEALER SENTENCED FOR BASIC SCIENCE VIOLATION

On October 13, 1959, Conrad Hanson, fifty-one, Strathcona, Minnesota, entered a plea of guilty before the Hon. Paul Lundgren, Judge of the District Court of Roseau, Minnesota, to an information which charged him with violating the basic science law by maintaining an office for the reception, examination, diagnosis and treatment of persons for diseases, deformities, etc. Judge Lundgren then sentenced the defendant to a term of six months in the Roseau County Jail and to pay a fine of $500. However, the Court, in addition to suspending $200 of the fine, stayed the execution of the jail sentence and placed Hanson on probation for one year. A criminal complaint against Hanson had been signed on July 21, 1959 by a representative of the Minnesota State Board of Medical Examiners after an investigation disclosed that the defendant was treating patients for various physical conditions in his living quarters in the rear of a grocery store operated by him in Strathcona.

When questioned by the Court prior to being sentenced, Hanson stated that he had been in the grocery business for twelve years at Strathcona and that within the past four years he had learned how to treat patients by taking instructions from a healer in Salem, South Dakota. Although Hanson denied that he had charged fees in connection with his healing activities, he admitted that patients left money in the form of donations and that he had kept the money. The defendant also stated that he had made trips to other towns to heal people, illustrating his remarks by saying that he had visited Lockhart and Winger, Minnesota for this purpose. In response to questioning, Hanson admitted that he had attempted to cure patients of such serious ailments as rheumatism, arthritis and heart conditions but he denied that he could cure cancer. Judge Lundgren then cautioned the defendant that one of the terms of his probation required him to refrain from engaging in healing in any manner.

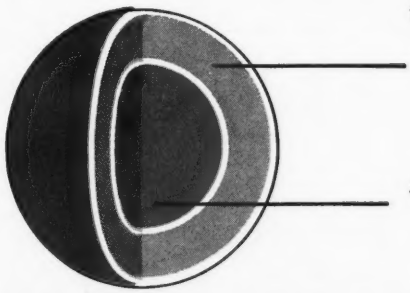
After the defendant's arrest on July 21, 1959, he gave a signed statement in which he said he had been treating from five to fifty patients per day, having seen seventeen that day, by rubbing the feet of the patients and using vibrators. He also stated that he gave out numbers to the patients to enable him to take them in proper order and that he received from 50c to $2.00 for each treatment, the most common amount being $1.00. According to Hanson, he was born on November 24, 1907 in Hues Township near Strathcona and has no education beyond grade school, having taken no scientific training of any kind. The defendant holds no license to practice any form of healing in the State of Minnesota.

From the point of view of the clinical pathologist, the finding of Bence-Jones protein in the serum is so rare, and its correlation with multiple myeloma is so high, that this positive finding imposes on the clinician the burden of proving that the disease in question is not multiple myeloma.



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Hyoscine hydrobromide	0.0033 mg.
Phenobarbital (⅛ gr.)	8.1 mg.
Pepsin, N.F.	150 mg.

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Pancreatin, N.F.	300 mg.
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In Memoriam

CHARLES CURRY BELL

Dr. Charles Curry Bell, St. Paul physician and surgeon, died October 9, 1959. He was seventy-one years of age at the time of his death.

A member of the staffs of Ancker, St. Luke's and St. John's Hospitals, St. Paul, he was also a member of the consulting staff of Miller Hospital.

Doctor Bell was born in Cowley County, Kansas; he was a graduate of the University of Oklahoma, Norman, Oklahoma, and Rush Medical College, Chicago.

He had offices in the Lowry Medical Arts Building, St. Paul, for several years and was active in the practice of industrial medicine.

Doctor Bell was a member of the American Medical Association, the Minnesota State Medical Association, the Ramsey County Medical Society, the St. Paul Surgical Society, the Minnesota Surgical Association, the Clinical Club and the Medical Assembly.

He was a past president of the Ramsey County Sportsmen's Association and a member of the St. Paul Athletic Club, the Masonic Lodge and Central Park Methodist Church.

Survivors include his widow, Violet J.; daughter, Mrs. Nancy Benton, New York City; three sons, Charles C. III, John M. and Richard J., all of New York City; three sisters, Annie E. Bell, S. Josephine Bell and Dr. Mary R. Bell, all of Oklahoma City, and four grandchildren.

THOMAS GRATZEK

Dr. Thomas Gratzek, St. Paul surgeon, died October 9, 1959, at his summer home in Harding, Minnesota. The deceased was seventy-four years of age at the time of his death.

Born in Florian, Minnesota, Doctor Gratzek was a graduate of the University of Illinois Medical School. He spent his internship at Cook County Hospital, Chicago, Illinois. Except for service in the Army Medical Corps in World War I, he had been a physician and surgeon in St. Paul since 1914.

He was a member of the American Legion, VFW Charles F. Skweres Post No. 2817, Polish National Alliance, Ramsey County Medical Society, the Minnesota State Medical Association and the American Medical Association. A Fellow in the American College of Surgeons,

(Continued on Page 1676)

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THOMAS GRATZEK

(Continued from Page 1672)

he was one of the founders of the St. Paul Polish-American Club.

He was a former Ramsey County Deputy Coroner.

Doctor Gratzek is survived by his widow, Thesesa A.; two daughters, Mrs. Lee Kunz, New Ulm and Mrs. Robert Emmons, St. Paul; a son, Dr. John B., Madison, Wisconsin; two brothers, John, Strandquist, Minnesota, and Dr. Frank, Anoka; four sisters, Mrs. Pearl Yutrzenka, Mrs. Amelia Przybylski, both of Argyle, Minnesota, Mrs. Andrew Riminski, Strandquist, Minnesota, and Mrs. Wanda Kuznia, Stephen, Minnesota, and ten grandchildren.

HOWARD R. HARTMAN

Dr. Howard R. Hartman, a former member of the permanent staff of the Mayo Clinic and Head of a section in the Division of Medicine, died October 6, 1959. He was seventy-one years of age at the time of his death.

He was born December 1, 1887, at Toledo, Ohio. He received the degree of Bachelor of Science in 1911 and that of Doctor of Medicine in 1914 from the University of Michigan.

Doctor Hartman came to Rochester after graduation where he served his internship at St. Mary's Hospital until June 30, 1915.

Doctor Hartman was on leave of absence from October 1, 1917, to March 31, 1918. On August 1, 1919, he was appointed a first assistant in medicine in the Mayo Foundation, and on October 1 of that year he was appointed to the permanent staff of the Mayo Clinic as an Associate in Medicine.

Doctor Hartman, for many years, was physician to virtually all the Spanish speaking patients coming to the Mayo Clinic.

In 1938 he served as president of the Section of Medicine of the Pan-American Medical Association, which held a seventeen-day meeting in the form of a cruise to Cuba and the West Indies during the course of which various tropical diseases were studied intensively.

In 1944, the President of the Republic of Colombia conferred on Doctor Hartman, the title of Officer of the Order of Boyaca of that country, and in 1940 he was decorated with the Order of El Sol de Peru.

He was a Fellow of the American College of Physicians and a member of the Zumbro Valley Medical Society, the Minnesota State Medical Association, the American Medical Association, American Gastroenterological Association, American Society of Tropical Medicine, International Society of Gastroenterology, Pan-American Medical Association, Alumni Association of the Mayo Foundation, Society of Sigma Xi, Nu Sigma Nu professional medical fraternity, and the Alpha Omega Alpha medical honor society.

Also he was an honorary member of the Academia Nacionale de Medicina of Rio de Janeiro, Brazil; the Sociedad Medico-Cirurgico del Guayaquil, Equador; Academia Nacionale de Medicine of Lima, Peru, and the Associacion Medico del Peru and the World Medical Association.

ROGER H. HASSETT

Dr. Roger H. Hassett, a former Mankato physician and surgeon for thirty years, died August 23, 1959, at his home at 603 Canyon Place, Salona Beach, California. He was sixty-two years of age at the time of his death.

Doctor Hassett was born on June 27, 1896, at Storm Lake, Iowa, and attended school in Currie and Westbrook, Minnesota, and the College of St. Thomas, the University of Minnesota, University of Illinois and the Chicago Institute of Surgery. He started practice in Mankato in 1921.

He was a member of the Knights of Columbus, the Kiwanis Club, the Elks Lodge, American Legion, 40 and 8, the Blue Earth County Medical Society, the Minnesota State Medical Association and American Medical Association.

Doctor Hassett was associated with Dr. H. J. Lloyd from 1932 to 1938 and with Dr. L. G. Samuelson from 1938 to 1942. He established the Medical Center in 1942.

Surviving are: his wife, Marie; two sons, Dr. Gerald Hassett of Encino, California; Roger John of Milwaukee; two daughters, Mrs. Mike Seisel (Patty) of Santa Clara, California, Mrs. Charles Hathaway (Marie) of San Leandro, California; eight grandchildren.



ALEXANDER JOSEWICH

Dr. Alexander Josewich, former Head of the Tuberculosis Section of Veterans Hospital of Minneapolis, died September 19, 1959, at the age of sixty-nine.

A native of Milwaukee, Wisconsin, Dr. Josewich came to Minneapolis when he was two years old. He earned his undergraduate and medical degrees from the University of Minnesota. He was the first physician in Minnesota called to do tuberculosis work in the Army in World War I. He spent thirty-seven years in Federal Medical Service before retiring in 1954.

Doctor Josewich helped organize the Theodor Petersen American Legion Post No. 1 and was a member of Adath Jeshurun Synagogue, Temple Israel, the Jewish War Veterans, Trudeau Medical Society, the Hennepin County Medical Society, the Minnesota State Medical Association and the American Medical Association.

Survivors include his wife, May; three daughters, Lois and Betty, both of Minneapolis, and Mrs. Seymour Ohsman, Cedar Rapids, Iowa; and two sisters, Georgia, Minneapolis and Florence, St. Paul.

* * *

CLYDE ALBERT UNDINE

Dr. Clyde A. Undine, Minneapolis physician for forty-two years, died August 20, 1959. Doctor Undine was seventy-three years old.

A native of Minneapolis, Doctor Undine graduated from the University of Minnesota and attended medical schools at the University of Nebraska and Tulane University. He was on the staff of Deaconess Hospital and during World War I, served as a Lieutenant Commander in the Navy Medical Corps.

Doctor Undine was a member of the Internists Society, the Hennepin County Medical Society, the Minnesota State Medical Association, the American Medical Association, the American College of Physicians, Diabetic Association, Phi Rho Sigma medical fraternity, Minneapolis Lions Club and St. Mark's Church.

Surviving are his wife, Effie; a daughter, Mrs. Bryant Halsey, Morristown, N. J., and a son, Clyde, Jr., Minneapolis.

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The Physician's Diary

Morgan physician, **Dr. Harvey A. Knoche,** recently moved to Gaylord where he took over the practice of **Dr. Duane C. Olson.** Doctor Olson left Gaylord to become associated with a group of doctors in Minneapolis.

* * *

Dr. John K. Grotting, Minneapolis, recently announced the appointment of **Dr. Lyle V. Kragh** in his practice of Plastic and Reconstructive Surgery.

* * *

Recent participants in national and international medical meetings from the Mayo Clinic include: **Dr. Waltman Walters** presented a paper at the meeting of the International Society of Surgeons in Munich; **Doctors E. A. Banner, J. H. Pratt, L. M. Randall** and **R. B. Wilson** attended a meeting of the American Association of Obstetricians and Gynecologists held in Hot Springs; **Doctors E. G. Harrison, J. W. Kernohan, T. B. Magath, C. A. Owen, Gertrude Pease, G. K. Stillwell, L. W. Weed** and **L. B. Woolner** attended the meeting of the American Society of Clinical Pathologists; **Dr. J. M. Waugh** assisted with examinations of the American Board of Surgery in Chicago; **Doctors C. F. Gastineau, J. S. Lundy** and **J. C. Lillie,** participated in the Annual Congress of the North American Federation of the International College of Surgeons; and **Dr. J. E. Edwards** presented the Richard Jaffee Memorial Lecture in Chicago.

* * *

Dr. A. I. Arneson, Morris, senior member of the Arneson and Watson Clinic, recently announced that he is resigning from the Clinic. Doctor Arneson plans to set up private practice limited to the practice of prescribing glasses and contact lenses and treatment of medical and surgical diseases of the eyes.

* * *

Dr. James A. Cosgriff, Jr., Olivia, recently toured Switzerland and Italy en route to Istanbul, Turkey, where he attended the European Rheumatologic Congress. **Dr. John Mayne,** Mayo Clinic, accompanied Doctor Cosgriff.

* * *

Dr. Carl E. Christenson, a recent graduate of the University of Minnesota Medical School has announced that he will begin the practice of medicine in Clinton sometime next year.

* * *

Mayo Clinic staff member, **Dr. Gershom J. Thompson,** was re-elected a Vice President of the United States Section, International College of Surgeons at a meeting of the College in Chicago recently.

* * *

Dr. Lester N. Dale, Red Lake Falls, was recently made an honorary Life Member of the Minnesota Podiatry Association at its annual convention held recently at Gull Lake near Brainerd.

* * *

The Head of a section of surgery in the Mayo Clinic, **Dr. William H. ReMine,** has been elected to the Society of Head and Neck Surgeons. **Dr. Arnold J. Kremen,** Minneapolis is president of the organization.

* * *

Doctor and Mrs. **Warner Ogden,** St. Paul, have left for a visit of six months in Ghana, West Africa, where Doctor Ogden has an assignment in surgery in one of the new hospitals built by the local government. Doctor Ogden went on a similar expedition to India two years ago.

* * *

The Falls Clinic of Thief River Falls has announced the appointment of **Dr. Erick Reeber** to the staff. Doctor Reeber comes from New York.

* * *

A member of the Olmsted Medical Group, Dr. **Malcolm K. Campbell** recently attended a three-day symposium of Diseases Common to Animals and Man at the State University of Iowa. The meeting was sponsored by the Institute of Agricultural Medicine of the University.

* * *

The LeSueur Hospital Board recently approved the appointment of **Dr. P. J. Hiniker** as Acting Chief of Staff for the hospital. Doctor Hiniker will retain this position until a formed medical staff has been organized.

* * *

The Thirty-fifth annual reunion and meeting of the Alumni Association of the Mayo Foundation was conducted in Rochester recently. **Dr. George A. Lord** of Hanover, N. H., presided at the meeting. He was a fellow in surgery from 1935-38. Other officers are **Doctors L. Raymond Scherer,** Minneapolis; and **Howard A. Anderson,** Rochester. **Dr. Donald C. Balfour** is honorary president. General chairman of this year's reunion was **Dr. G. A. Peters;** Program Chairman was **Dr. C. A. Owen, Jr.,** and **Dr. H. J. Svien** was chairman of the Committee on Local Arrangements.

* * *

Dr. C. E. Thiem, Mankato, addressed the Medical Record Librarians of districts four and six at their regional meeting in Mankato recently. "Coding of Cardiac Diagnosis" was the topic of Doctor Thiem's talk.

* * *

Doctors of eight counties in the original Southwestern Minnesota sanatorium district payed tribute to **Dr. Sidney A. Slater,** Worthington, at the regional conference

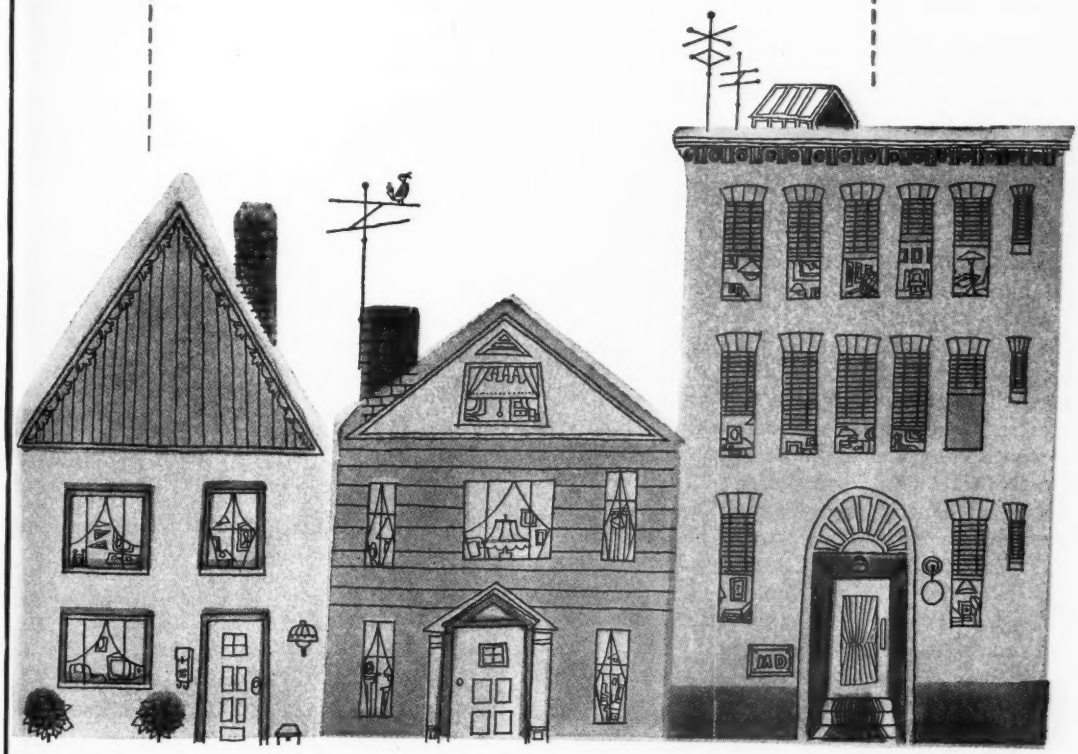
(Continued on Page 1680)

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BONADOXIN also effectively relieves nausea and vomiting associated with: anesthesia, radiation sickness, Meniere's syndrome, labyrinthitis, cerebral arteriosclerosis and motion sickness.

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TRISERT POWDER—Available in 4 gr. individual treatment bottles. 12 to carton.

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(Continued from Page 1678)

on tuberculosis in Worthington. The doctors, all lifelong friends of Doctor Slater were **Doctors C. L. Sherman,** Luverne, representing Rock County; **W. G. Benjamin,** Pipestone, representing Pipestone County; **R. F. Pierson,** Slayton, Murray County; **Walter H. Halloran,** Jackson, Jackson County; **J. H. Dokken,** Windom, Cottonwood County; **W. H. Valentine,** Tracy, Lyon County; **A. L. Vadheim,** Tyler, Lincoln County; and **E. A. Kilbride,** Worthington, Nobles County.

* * *

The Fall Meeting of the Red River Valley Medical Society was held recently in Crookston. **Dr. John Gordon,** University of Minnesota, discussed problems in anesthesia.

* * *

Dr. Kenath H. Sponsel, Minneapolis, recently was a guest speaker at the Aberdeen, South Dakota, District Medical Society meeting. "Hip Fracture" was the subject presented by Doctor Sponsel.

* * *

The Minnesota community of Clarissa recently honored **Doctor** and Mrs. **F. N. Grose** on their silver wedding anniversary. The community held an Open House for the couple.

* * *

Luverne physicians, **Doctors E. S. Boone** and **A. C. Martin,** recently announced that their offices have been moved to a new building at 413 West Main in Luverne. The doctors will maintain individual offices and separate practices but will share a reception room and x-ray facilities.

* * *

The promotion of **Dr. William C. Bernstein,** St. Paul, to Clinical Professor of Surgery was recently announced.

* * *

Dr. Ralph Papermaster, Two Harbors, has recently been elected president and chief of staff at the annual meeting of the medical staff of the Lake View Memorial Hospital. Also elected to medical staff positions were **Dr. Harold Leppink,** vice president and **Doctor Gerald Church,** secretary-treasurer.

* * *

International Falls physician, **Dr. R. D. Hanover,** has given the village of Big Falls his former office building located in that village. The property consists of four lots and a modern house.

* * *

Guest speaker at the McLeod County Public Health Association annual dinner meeting was **Dr. E. M. Litin,** Rochester. Doctor Litin's topic was mental health.

* * *

The community of Cannon Falls recently announced the completion of the **Dr. M. R. Williams'** Medical Arts Building. The doctor and his staff have moved into the building.

Over seven hundred friends from the Fulda area recently honored **Doctor** and Mrs. **B. M. Stevenson** at Memorial Hall, Fulda. The friends gathered to bid a farewell to the Stevensons who left recently for Oregon.

* * *

The Surgical and Medical Clinic of Albert Lea announced the recent appointment of **Dr. Jack T. Berry** to the staff.

* * *

Dr. W. H. Parker and **Dr. K. J. Halverson** of the Mesaba Clinic, recently announced the appointments of **Doctors E. P. Bryant** and **L. M. Flannary** to be associated with them in the practice of medicine.

* * *

The community of Ellendale recently announced that **Doctor Myron Doebler** has accepted a practice of medicine in that community. Doctor Doebler has been practicing in Pine River where he has been associated with **Doctor Charles Pelzl** of that community.

* * *

The Minneapolis Board of Public Welfare recently filled two key posts in the medical staff of General Hospital. **Dr. Fred W. Hoffbauer** was named Chief of Medical Services and **Dr. William Jepson** was named Chief of Psychiatry. **Dr. Thomas Lowry** is the hospital's medical director.

* * *

Ten Minnesota surgeons were among the approximately 1,015 surgeons who were inducted recently as new Fellows of the American College of Surgeons in cap-and-gown ceremonies closing the annual five-day Clinical Congress of the world's largest organization of surgeons. Those receiving this distinction from Minnesota at the 1959 Convocation are as follows: **Dr. George N. Kraemer,** Fairmont; **Dr. Calvin J. Johnson,** Grand Rapids; **Dr. Martin A. Nordland,** Minneapolis; **Doctors John C. Campbell, James K. Masson,** and **Charles R. Sullivan,** Rochester; **Doctors Jerome A. Hilger** and **Lloyd D. MacLean,** St. Paul; and **Dr. Oskar P. Friedlieb** of Virginia.

* * *

Dr. Louis A. Buie, Mayo Clinic and a member of the staff until 1955, was made an honorary member of the Royal Society of Medicine of England on July 1, according to information received from London. The certificate of honorary members, signed by **Dr. Henry R. Thompson,** president of the society, indicates that the honor was conferred upon Doctor Buie "for distinguished services to science."

* * *

Replacing **Dr. Reynold A. Jensen,** Professor of Child Psychiatry at the University of Minnesota, while he is on sabbatical leave will be **Dr. Leo Kanner,** Professor of Child Psychiatry at Johns Hopkins Hospital, Baltimore, Maryland. Doctor Jensen will study child psychiatry techniques, facilities, and research programs in Europe while on leave during academic years 1959-60.

* * *

Dr. A. C. Kerkhof, president of the Minnesota Heart Association announced that the association will support heart research with an additional $35,000 raised by the independent Heart fund this year.

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A recent luncheon speaker for the Variety Club Auxiliary was **Dr. C. Walton Lillehei,** University of Minnesota. Doctor Lillehei spoke on medicine in Russia and the United States.

* * *

Mayo Clinic physician, **Dr. E. H. Rynearson,** was the speaker at the Thirty-seventh Annual Cedar Valley Council Fellowship Dinner at the Central High School in Austin.

* * *

Dr. Gerrit Beckering, Edgerton, was the recent subject of a series featuring Edgerton businessmen and women in the *Edgerton Enterprise.* The installment gave the biography of Doctor Beckering.

* * *

Physicians in the Olmsted Medical Group in Rochester recently announced the appointment of Dr. Werner Kaese of Reading, Pennsylvania, as a specialist in obstetrics and gynecology. Partners in the Olmsted Medical Group are: **Drs. H. A. Wente, J. E. Verby, James R. Doyle, H. F. Burich, M. K. Campbell, W. R. Weyhrauch, John C. Brodhun, L. T. Wood** and **John O. Fluegel.**

* * *

"Diagnostic Radioisotopes," by **Dr. Charles A. Owen,** head of the section of Biochemistry and Associate Professor of Pathology of the Mayo Foundation, was recently issued by Charles C Thomas, Springfield, Illinois, publisher of medical books. The volume contains 425 pages and seventy-one illustrations.

* * *

Dr. M. Kosiak, University of Minnesota, discussed the treatment of rheumatoid arthritis at a recent meeting of the East Central Minnesota Medical Society. Officers were nominated for the election next spring.

* * *

Two Mayo Clinic consultants were among participants in the presentation of the scientific program at the District Six meeting of the American College of Obstetricians and Gynecologists recently in Omaha. The consultants are **Dr. Edward A. Banner** and **Dr. James S. Hunter, Jr.** More than thirty physicians presented scientific papers or participated in panels covering important phases of obstetrics and gynecology.

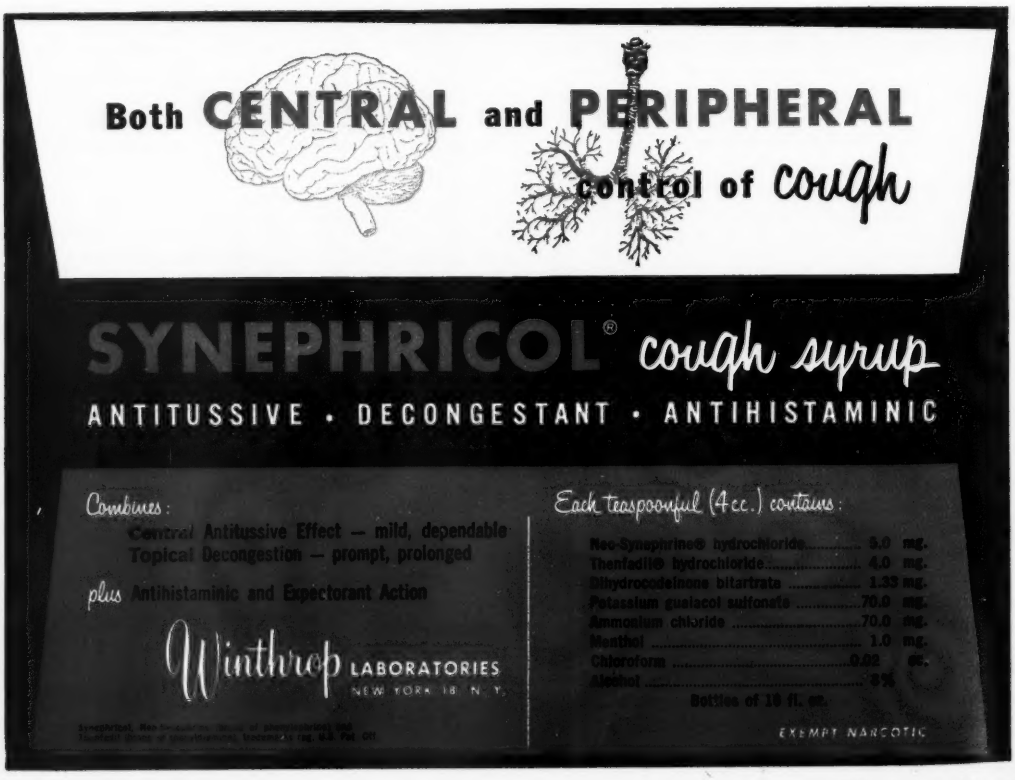
* * *

Fairmont physician, **Dr. Julius Heimark,** has advanced a theory in the treatment of heart ailments that has been accepted by such authorities as **Dr. Paul Dudley White.** Doctor Heimark recently received a letter from Doctor White stating that he would incorporate Dr. Heimark's method in his future treatment of coronary disease.

* * *

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(Continued on Page 1687)



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Clarence S. Livingood, M.D., Detroit, Mich.
Dermatology

Henry D. Janowitz, M.D., New York, N. Y.
Gastroenterology

John G. Walsh, M.D., Sacramento, Calif.
General Practice

E. Stewart Taylor, M.D., Denver, Colo.
Gynecology

Charles H. Burnett, M.D., Chapel Hill, N. C.
Internal Medicine

Peter C. Gazes, M.D., Charleston, S. C.
Internal Medicine

Donald D. Matson, M.D., Boston, Mass.
Neurosurgery

Frank R. Lock, M.D., Winston-Salem, N. C.
Obstetrics

Trygve Gundersen, M.D., Boston, Mass.
Ophthalmology

Carroll B. Larson, M.D., Iowa City, Ia.
Orthopedic Surgery

John J. Conley, M.D., New York, N. Y.
Otolaryngology

W. A. D. Anderson, M.D., Miami, Fla.
Pathology

Franklin H. Top, M.D., Iowa City, Ia.
Pediatrics

Raymond J. Jackman, M.D., Rochester, Minn.
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David G. Pugh, M.D., Rochester, Minn.
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(Continued from Page 1682)

recently interviewed **Dr. Charles W. Mayo,** Mayo Clinic, in Part I of a series on "Our Heritage." Doctor Mayo explained the origin and development of the Mayo Clinic.

* * *

Dr. John S. Lundy, Mayo Clinic, was a recent speaker at the first annual dinner of Winona County dentists, physicians and pharmacists. The program was arranged by the Winona County Dental Society, and the social hour by the Winona Pharmaceutical Association. Present at the dinner was **Dr. Warren W. Haesly,** vice president of the Winona County Medical Society.

* * *

Proctor physician, **Dr. F. H. Dickson,** was recently named president of the Minnesota Academy of General Practice. Doctor Dickson will assume the presidency in the fall of 1960.

* * *

The community of Bigfork recently held a farewell dinner for **Dr. E. J. Detjen,** his wife and family. Doctor Detjen received a clock and barometer on a stand with the engraving, "In appreciation of your untiring helpfulness and kindness. Northern Itasca Hospital."

* * *

Delegates attending a Christmas Seal regional conference in Austin recently heard **Dr. Bruce Douglass,** Rochester, state that the nation still faces a big problem in the control of tuberculosis. The regional meeting and dinner was preceded by a meeting of the Mower County Tuberculosis and Health Association.

* * *

The Morris Medical Center has announced that **Dr. Glenn W. Brown** will be associated with them in the practice of medicine.

* * *

Dr. A. Giesbrecht, Hallock physician, recently announced that he is leaving Hallock. Doctor Giesbrecht is moving to Denton, Texas, where he will set up a private practice.

* * *

A Mayo Clinic physician, **Dr. Keith Stillwell,** was a recent speaker at the annual meeting of the National Rehabilitation Association in Boston, Massachusetts.

* * *

The new office building of **Drs. A. C. Martin** and **E. S. Boone,** Luverne physicians, was recently completed, and the two doctors are now established in practice there.

* * *

Dr. Dale Cameron, Director of Medical Services, Minnesota Public Welfare Department, was a recent speaker at a luncheon of the special education section of the Minnesota Education Association. Doctor Cameron spoke on "Man Against Himself."

* * *

Two parties were held in honor of **Dr. M. H. Power,** Mayo Clinic, who recently retired. Members of the biochemistry staff and their wives honored the doctor and his wife at a dinner. Employees of the laboratory and friends gave an informal party.

(Continued on Page 1688)

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(Continued from Page 1687)

Minnesota physicians attending the thirty-fifth annual meeting of the American Heart Association recently in Philadelphia were: **Dr. A. C. Kerkhof,** president of the Minnesota Heart Association and **Dr. Karl W. Anderson,** immediate past president.

* * *

An Ely Clinic staff member, **Dr. M. G. Dobler,** has recently returned from several weeks' stay in Europe. While there, he did three weeks' postgraduate study at the International Congress of Surgery in Munich, Germany. He was also guest physician at the University of Zurich, Switzerland, and the University of Tübingen, Germany.

* * *

Dr. Randall G. Sprague, Mayo Clinic, recently was honored as one of Northwestern University medical school's distinguished alumni during ceremonies marking the school's 100th anniversary.

* * *

Olmsted Medical Group staff member, **Dr. John R. Watson,** recently announced that he will move to Medford, Oregon, where he will enter the private practice of obstetrics and gynecology.

* * *

Dr. Arthur H. Wells, Duluth, has been elected to the Board of Directors of the American Medical Writers Association. Doctor Wells is Editor-in-Chief of MINNESOTA MEDICINE.

* * *

The twenty-third annual Montana-Wyoming regional meeting of the American College of Physicians held in Billings, Montana, recently had as banquet speaker, **Dr. Wesley W. Spink,** Minneapolis. Dr. Spink spoke on "The Education of a Doctor."

* * *

A group of former associates of **Dr. John S. Lundy,** Mayo Clinic, recently honored Doctor Lundy on his retirement. Doctor Lundy is a founder of the Mayo Clinic's Section of Anesthesiology.

* * *

St. Paul physician, **Dr. John F. Briggs,** and University of Minnesota physician, **Dr. J. Arthur Myers,** recently spoke on diseases of the heart and lungs at a convention of the American College of Chest Physicians.

* * *

Dr. A. B. Sundberg, Heron Lake, was recently named medical consultant to the Jackson County Tuberculosis and Health Association. Doctor Sundberg succeeds the late **Dr. S. A. Slater** of Worthington.

* * *

Delegates at the forty-fifth annual clinical congress of the American College of Surgeons in Atlantic City heard **Dr. William B. Stromme,** Minneapolis, present a paper on "Intra-uterine Fetal Deaths in the Second Trimester."

* * *

Doctors from the Mayo Clinic who served on the committee to select awards given during the thirty-fifth annual meeting of the Alumni Association of the Mayo Foundation were **Dr. James W. Kernohan** and **Dr. C. F. Gastineau.**

The Diarrhea of American Travelers Abroad

Presented at the clinical meeting of the American Medical Association, Minneapolis, Minnesota, December 4, 1958.

B. H. KEAN, M.D.
New York, New York

Dr. Kean is Associate Professor of Clinical Medicine (Tropical Medicine), Cornell University Medical College, New York City.

DURING the past several years my colleagues, Dr. Wilson G. Smillie, Dr. Gerardo Varela, Somerset R. Waters, Dr. Harold A. Tucker, others and I have conducted a series of small studies, each designed to answer a few specific questions about the diarrhea of travelers. The initial studies were conducted among 800 U. S. students traveling to Europe. From these investigations it was determined that the diarrhea of travelers, at least of travelers to Europe, was not due to amebae, to *Trichomonas hominis,* to *Giardia lamblia,* or to any known parasite. In addition, it was established that the incidence of diarrhea was approximately twice as high among those who went to southern Europe and to the Mediterranean area than in those who visited the northern part of Europe, especially Scandinavia. For several reasons, which included the cooperation of the authorities and the availability of a large number of students, the investigations were transferred to Mexico. I would like to report to you briefly on the results of three of our studies there.

Using epidemiologic methods, we interviewed, at the Los Angeles Airport, approximately 1200 U. S. tourists returning to the United States from a vacation trip to Mexico. Half were males and half were females. Thirty-three per cent became ill the first week, and over 90 per cent became ill within the first fortnight of their trip to Mexico. In most, the duration of the illness was brief—one day, but at least half were sick two to four days. Most suffered only one attack, but one-half were sick two or more times. The illness, on the whole, was mild but approximately half of the tourists to Mexico were sick enough to be confined to quarters at least part of their vacation.

A rather unexpected observation was the fact that the incidence of diarrhea appeared to be considerably higher in the younger than in the older. In the student age group (twenty-four years

of age and under) 43 per cent were ill, whereas of the senior citizens (over fifty-five years) only 18 per cent became ill. Whether this represents a reflection of the habits of the travelers or has basic immunologic foundation, is not known.

There has been a lot of speculation as to whether psychologic factors, liquor, and the excitement of travel could be responsible for travelers' diarrhea. To evaluate this aspect of the problem, we interviewed 200 tourists who had just returned from a vacation in Hawaii instead of Mexico. Only 7 per cent reported the development of diarrhea during their visit to Hawaii in contrast to the 33 per cent who became ill in Mexico.

Following these elementary epidemiologic studies, a different type of project was designed in hope of answering the following question: are any of the known, common, enteropathogenic bacteria responsible for the diarrhea of tourists? We arbitrarily defined pathogenic bacteria of the intestinal tract as the following: Salmonella sp., Shigella sp., Klebsiella sp., Paracolobactrum sp., Proteus sp., and twelve different serologic subspecies of *Escherichia coli.* Sixty-two recently-arrived U. S. students studying in Mexico summer school (1958) were asked to provide a stool specimen every day for fourteen consecutive days before, during, and after their illness to ensure the culturing of pathogenic bacteria which might be present in the stool only briefly. It was anticipated that approximately 35 to 40 per cent of the students would become ill. Actually, of the sixty-two, thirty-five remained well and twenty-seven did become ill.

Of the thirty-five well students, twelve had Paracolobactrum sp. scattered rather indiscriminately during the fourteen-day study period, five had Klebsiella sp., and two had pathogenic *E. coli.* Of the twenty-seven sick, fifteen had Paracolobactrum sp., eight had Klebsiella sp., and nine had pathogenic *E. coli.* In none of the sixty-two was Shigella sp. cultured, and in none of the sixty-two was Salmonella sp. cultured. Our conclusions were as follows: first, that neither Shigella nor Salmonella were responsible for tourists' diarrhea; and second, that the scatter and the distribution of the other arbitrarily-designated pathogens was such, that to assign an etiologic role to any of these organisms would be extremely hazardous. In fact, our impression was that the "pathogens" appeared in the same fashion that secondary invaders appear in respiratory tract infections of viral origin. In studies to be conducted in 1959-1960, an effort will be made to incriminate some of the enteropathogenic viruses and to assess the role of staphylococci.

We can now turn to a study in prophylaxis with drugs. In our first epidemiologic study involving a questionnaire of 1265 tourists, 444 indicated that they had used some medication. Of these, more than half contracted diarrhea. The most popular drug was halogenated quinoline iodochlorhydroxyquin marketed under the name of Entero-Vioform. Many of our colleagues have used this preparation with a great deal of enthusiasm.

In our experiment, approximately 600 American students in two schools in Mexico City were asked to take a drug twice a day for fourteen days from the day they arrived in Mexico. This was not actually accomplished—most did not start taking the drug until three days had elapsed. The students "checked in" every day at our health center and if they became ill with diarrhea, the drugs were stopped and an investigation was made.

The three drugs which were tested were as follows: First, Entero-Vioform—it is the most popular and has been recommended by many authorities. The dose was 375 mg. twice a day. The second drug was neomycin. The dose was 375 mg. twice a day—not a large dose, but since we were dealing with unprotected students it was best to be conservative. Small amounts of kaolin and pectin were included in this preparation, which was unfortunate, although the neomycin was the only drug present in effective doses. The third drug was a lactose placebo. All preparations were packaged in exactly the same fashion, with the same size, same taste, and same color; those administering the drugs did not know which drug they were using.

Iodochlorhydroxyquin, Entero-Vioform, proved ineffective. Of those taking the drug, 38 per cent became ill. Of those taking the placebo, 33 per cent became ill. Neomycin scored somewhat better —only 20 per cent became ill.

A more dramatic set of figures was derived by segregating approximately 150 students who began taking the drug on the day of arrival. Of this 150 students, exactly 35 per cent became ill when they took the placebo, 35 per cent became ill when they took Entero-Vioform, 16 per cent became ill when they took the neomycin.

Our conclusion from this study was that Entero-Vioform was no more effective than a placebo and that neomycin had some suggestion of effectiveness.

We are not prepared to advocate the use of any preparation for the prophylaxis of tourist diarrhea. Future studies and the direction they should take must be reasonably obvious to this group. Since 1,500,000 U. S. students travel abroad each year and since this number will likely increase in the next decade, the magnitude of the problem can hardly be exaggerated.

Questions Asked of Dr. Kean at the End of His Presentation

Question: Is there any relationship between this diarrhea and the consumption of liquor by travelers?

Answer: There is no major relationship to drinking. We had no reason to believe that drinking of American tourists in Hawaii was less than in Mexico, although we do admit that the caliber of the drinking may have been different. However, more important, the incidence of diarrhea was twice, almost three times as high in students who went to southern Europe than in those who went to northern Europe. We think the quantity of alcohol consumed was probably the same but it is true that the combinations of liquor might have been different.

Question: Although this is outside the scope of your present studies, Dr. Kean, how do you feel about drinking water?

Answer: We feel that from the day one leaves the continental United States, with the exception possibly of Canada, Hawaii, and England, that the drinking of tap water should be "verboten." Drinking tap water in France, Italy, and most of the other countries which esthetically would be considered civilized, in my opinion, is dangerous.

Question: What about fresh vegetables?

Answer: Fresh vegetables are dangerous even when consumed in New Jersey. Nevertheless we again must make a geographic limitation. We do not think there is any effective way of cleaning or sterilizing fresh vegetables. Potassium permanganate or chlorine, acetic acid, and other preparations are not effective. A blow torch might clean up lettuce in Mexico or in southern Europe. There is very little chance of Americans developing vitamin deficiency during a trip abroad. I have the rather parochial feeling that when we leave the areas where we feel comfortable and safe, that fresh vegetables had better not be consumed. This is especially true for those who are taking a brief trip and to whom two or three days' illness represents a major hazard. If you have any particular countries in mind we might modify this. I suspect lettuce in Scandinavia is safe but most of us go to more exotic parts of the world and there the answer is: "no."

Question: Once it develops, is there any effective treatment of travelers' diarrhea?

Answer: Once the diarrhea develops it follows such a systematic course that almost any treatment that is used will get credit for cure. It is on this basis that so many of the drugs have been popular for so long. Nevertheless there are certain principles of treatment of travelers' diarrhea which should be mentioned. First, it seems perfectly reasonable to advocate that we eat rather than starve. A wonderful, nutritious diet available abroad in almost any part of the world is tea, rice, and applesauce—tea for the liquid, rice for a sense of nutrition, and applesauce because it is comforting and possibly because it contains tannins. A useful drug is paregoric. If fever is present one of the antibiotics—a sulfonamide or tetracycline could be used—but only a very small percentage of these patients is sick enough even to raise the problem of antibiotics. Tea, rice, applesauce, and a little paregoric for twenty-four to forty-eight hours, will usually keep the patient comfortable for the twenty-four to forty-eight hours of illness.

Question: Since paregoric is an opiate derivative, won't some difficulty be encountered in taking it from country to country?

Answer: That is a most important point and I am glad you raised it. It is against the law for a patient or a doctor to take paregoric—even one ounce of paregoric—outside the United States or across any international borders. It would be unwise to recommend to any public group that paregoric be taken abroad. However, in those countries where the narcotic problem is the greatest, there it is most difficult to obtain a reasonable amount of paregoric. If you were to prescribe a small amount, for example 120 cc. of paregoric to a patient on general principles and that patient were to take that paregoric abroad, it is unlikely that any question would be raised by the authorities. But once again, it would be extremely unwise to make such a recommendation to any public group.

References

1. Kean, B. H., and Smillie, W. G.: Intestinal protozoa of American travelers returning from Europe. New England J. Med., 251:471-475, 1954.
2. Queries and minor notes: Prophylaxis of amebiasis. J.A.M.A., 164:505, 1957. Ibid., 165:1518, 1957.
3. Kean, B. H., and Waters, S.: Diarrhea of travelers. I. Incidence in travelers returning to the United States from Mexico. A.M.A. Arch. Indust. Health., 18:148-150, 1958.
4. Varela, G., Kean, B. H., Barrett, E. L., and Keegan, C. J.: Diarrhea of travelers. II. Bacteriologic studies in U. S. students in Mexico. Am. J. Trop. Med., 8:353-357, 1959.
5. Kean, B. H., and Waters, S. R.: Diarrhea of travelers. III. Drug prophylaxis in Mexico. New England J. Med., 261:71-74, 1959.
6. Kean, B. H.: Medical advice to travelers. New England J. Med., 256:1088-1092, 1957.

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Experiences with the Billroth I Gastric

● *Despite the speed with which many medical and surgical techniques become old-fashioned, "ancient" procedures may continue to be valuable. Such is true of the Billroth I method for gastrectomy. Since its birth in 1881, it has gone through several cycles of wide application and neglect. This article emphasizes its current application and the excellent results it produces in properly selected cases.*

THE BILLROTH I operation has been discussed considerably in the last several years. This is an old operation, actually representing the method employed by Billroth in his first successful gastrectomy, and it became rather routine in many surgical centers in which resection was employed largely for gastric lesions (before duodenal ulcer was treated by removal of part of the stomach). When European surgeons focused great attention on gastric resection for duodenal ulcer and when variations of the Polya operation became commonplace, the Billroth I procedure was neglected in many places. During and immediately after World War II, a great reawakening of interest in the Billroth I method was evident, and a large series of patients so treated is now available for significant review.

Several variations have occurred in the Billroth I concept. Billroth himself did largely an antrectomy in his first operation, in 1881. He narrowed the aperture of the stomach by closing a bit of the lesser curvature before accomplishing end-to-end gastroduodenostomy. Two years later, Kocher publicized his method of closing the gastric aperture completely and anastomosing the duodenum to the posterior wall of the stomach just proximal to this point of closure. In 1911, Schoemaker made a significant contribution, pointing out that all or most of the lesser curvature of the stomach might be removed and that, by closing this aspect at a sharp angle, one created a tubelike structure from the remnant of the greater curvature, allowing retention of a good portion of functioning stomach; a satisfactory end-to-end gastroduodenostomy was the final step. Von Haberer, in 1922, followed by Finney 1 year later, made known the still useful method in which the stump of the duodenum is closed and, after complete mobilization, the side of the duodenum is anastomosed with the cut end of the stomach. Horsley, in 1926, merely reversed the Schoemaker principle by closing a portion of the greater curvature and placing the anastomosis toward the lesser curvature. Finally, in 1933, Von Haberer described a method (that must have occurred to many surgeons long before) in which the pouch of the gastric remnant simply was puckered down to meet the stoma of the duodenum in a complete end-to-end fashion.

My own interest in the Billroth I type of operation developed in 1947, when it was demonstrated that, in the very occasional total gastrectomy, reconstruction might be accomplished by end-to-end esophagoduodenostomy. This was true large-

Billroth Resection

EDWARD S. JUDD, M.D.
Rochester, Minnesota

Read at the meeting of the Minneapolis Surgical Society, Minneapolis, Minnesota, May 7, 1959.

From the Section of Surgery, Mayo Clinic and Mayo Foundation, Rochester, Minnesota.
The Mayo Foundation is a part of the Graduate School of the University of Minnesota.

ly in patients who had lost a good deal of weight and who had a certain amount of visceroptosis. In addition, tension could be removed from the anastomosis by complete "Kocherization" of the duodenum, followed by suture of the duodenum to the anterior surface of the pancreas to eliminate all dragging and pulling on it. The advantages of this method appeared obvious, and I have continued to employ it in isolated instances. The fact that total gastrectomy may be done in this manner certainly answers critics of the Billroth I operation, who consider that it is impossible to resect a sufficient amount of stomach and still employ an end-to-end anastomosis.

Technical Observations

A decision concerning the type of reconstruction is not made until the extent of the resection has been thoroughly mapped out and the commitment is clear. If it then appears that any degree of tension will be present, the duodenal stump is inverted in the usual manner and some form of a Billroth II operation is used. One may remove the entire lesser curvature readily, if he wishes, and may close over this aspect of the stomach by employing the Furness clamp and pin (Schoemaker method). The use of matching anastomotic clamps makes it easy to assess the exact amount of greater curvature to be encompassed for purposes of anastomosis, as the duodenum already has been measured in its matching clamp when it is severed. I am still old-fashioned enough to want two complete rows of suture to close the Schoemaker aspect of the repair, and I frequently buttress this with a final layer.

I have preferred the open method of anastomosis for some time, as the surgeon can tell more accurately just where each stitch is going and he is less likely to invert too large a "cuff," resulting in obstruction. Also, the incidence of hemorrhage at the suture line is more readily minimized, as the suture line may be inspected by removing the clamp momentarily and securing any bleeding points by direct suture before the final rows are placed. Special attention must be paid to the "fatal angle of Billroth," which is at the bottom end of the Schoemaker reconstruction of the lesser curvature where the upper margin of duodenum is joined to the anastomosis. It is extremely important to place a deep mattress suture of silk, which passes first through the anterior gastric wall and then into the posterior gastric wall, continuing across the upper aspect of the duodenum and finally back to the anterior

gastric wall. When this suture is snugged up, it results practically in a purse string, with effective closure of this previously troublesome angle.

Conditions in Which the Operation Is Used

Peptic ulcer is the primary indication for this operation, which continues to have wide acceptance at the Mayo Clinic in the treatment of gastric ulcer. It is a temptation to employ it also for duodenal ulcer, but the duodenal ulcer that demands surgical treatment often has distorted the duodenal wall so greatly that one would scarcely consider use of the Billroth I procedure. However, my colleagues and I do use it in certain instances. Some authorities consider that carcinoma of the stomach is an absolute contraindication to use of the Billroth I technic. However, we have not hesitated to use it if the carcinoma is well away from the duodenum and if complete and radical subtotal gastrectomy is possible without any compromise. In the cases of severe chronic gastritis that occasionally confront the surgeon who is operating as the result of a mistaken diagnosis and who is reluctant to do only gastrotomy and biopsy, especially when hemorrhage is a part of the history, this operation has proved useful. It is a temptation to employ this procedure rather frequently for gastrojejunal ulcer in which extensive resection of the jejunum, with repair and prolonged and difficult manipulation, is required to carry out a proper high gastric resection. We have yielded to the temptation on occasion, although we have attempted to individualize the cases. The method has a certain appeal in the treatment of multiple polyposis of the stomach, as it minimizes surgical intervention. The operation is also useful in other and less common situations.

Duodenal Ulcer and the Billroth I Resection

My senior colleague, Dr. Waltman Walters, frequently has pointed out that the rate of recurrent ulceration after use of the Billroth I method in treating duodenal ulcer is too high to allow its routine employment. He argues, with considerable weight of evidence, that the constant regurgitation of alkaline material into the stomach, which is an accompaniment of the Polya or the Billroth II method, is usually lacking after the Billroth I procedure. More often, we have not employed the operation, as already mentioned, because a badly distorted duodenum tends to discourage consideration of an anastomosis to be placed there. On such occasions, we are satisfied to obtain some type of closure of the stump that will not disrupt. Critics of this operation have said that the enthusiasts would be inclined to do too limited a resection because they are thinking ahead to the anastomosis and may remove a suboptimal amount of stomach. However, when one reflects on the occasional total gastrectomy done with an end-to-end anastomosis, this does not appear to be a valid argument. As indicated previously, we still do an occasional Billroth I operation for duodenal ulcer when the situation appears to be correct. This might include the elderly patient who would not withstand a prolonged operation or the patient with an acutely perforated ulcer in whom resection as an emergency procedure apparently is feasible.

Other Operations Concomitant With This Procedure

Since the Billroth I method represents the least amount of operative intervention in gastric resection, it is useful when other surgical procedures might be done at the same time. If a more prolonged and complex operation were done on the stomach, the surgeon might be tempted to leave the extirpation of other lesions for another day. Thus, splenectomy occasionally is done without undue regard to having imposed too much surgical risk. Cholecystectomy is not at all unusual as a secondary procedure. Appendectomy frequently is done without great concern. The "take down" of a previous gastroenteric stoma, with resection or repair of the jejunum and immediate resection of the stomach, often is done most advantageously in this way. Extensive ventral hernias have been repaired at the same time as the Billroth I operation. Partial hepatectomy, partial pancreatectomy, segmental colonic resection and numerous other operations have been conducted successfully at the same time.

Our Present Stand

At present, several surgeons at the Mayo Clinic are enthusiastic about the Billroth I method in the treatment of benign gastric ulcer because we think that we can remove exactly as much stomach as desirable and still re-establish continuity in the most simple and direct fashion.

Several of us are interested in hemigastrectomy plus vagotomy for those patients requiring gastric

resection for duodenal ulcer who, in an earlier year, would have been candidates for "gastric crippling" if an extremely high gastric resection were done. The procedure of combining vagotomy with removal of half of the stomach and completing the operation by a Billroth I method strikes an attractive compromise that bears further watching. We have a growing series of such patients who all suffered from complications of duodenal ulcer and who now are flourishing without the numerous side effects that might have been the rule otherwise. It is still too early to allow final conclusions, but present impressions lead us to continue the trial.

Carcinoma of the stomach, if it is not too close to the pylorus, can be well handled by this method. All of the omenta can be removed, along with the spleen, various groups of lymph nodes, and part of the pancreas, if desired, and reconstruction still can be accomplished by the end-to-end method; although this extensive procedure is not often feasible, it works out well on occasions. I recently examined a patient who had this operation six years ago, at which time several lymph nodes in the omentum were found to be metastatically involved. At present, the patient is in excellent health; roentgenologic studies reveal a small gastric remnant that functions efficiently, with no evidence of recurrence.

Gastrojejunal ulcer already has been mentioned as a possible indication for this operation. After the surgeon takes down the gastroenteric stoma, which may be a hazardous procedure if the transverse mesocolon is badly involved, completely mobilizes the ulcer, resects the jejunum and does an end-to-end anastomosis, he is still faced with a high gastric resection, which may impose a great deal of surgical trauma on a rather depleted patient. In such instances, it is a temptation to use the Billroth I method, and I have done it fairly frequently, apparently with good results. The combination of this operation with vagotomy gives at least theoretic protection against further recurrent ulceration.

Advantages of the Operation

Obviously, this is by far the simplest method to achieve the desired results. It is not necessary to attach the stomach to the intestine at some distance from the point where nature intended it to be attached. Only one suture line is present, which minimizes the constant worry of the surgeon in this regard.

The method is relatively safe. Recent study of a large series at the clinic shows a mortality rate of less than 2 per cent.

It is the most direct method that can be devised. The food enters the duodenum at almost the normal natural level, and it is mixed with bile, pancreatic juice and succus entericus exactly where nature intended it to be. It is our opinion that the immediate postoperative convalescence is definitely better for this reason. "Dumping" and similar unpleasant side effects occur less frequently than they do after other procedures. Analysis of feces in many of our patients demonstrates that the loss of fat and nitrogenous products in the stool after a Billroth I operation is consistently less than it is after a "full width" Polya procedure. Not only is the early convalescence usually much easier for the patient but the long-term situation appears to be better. Further evidence in this regard is forthcoming when one hears surgeons advising that those patients not doing well after the Billroth II operation for duodenal ulcer (because of the dumping syndrome) should have their reconstruction altered by the Billroth I method.

Finally, from the technical standpoint, the surgical dilemma is kept to a minimum. There is no duodenal stump to worry about, which is often the source of the extremely difficult and occasionally fatal complications that may arise with other methods. Also, there is no dilemma concerning the anterior versus the posterior position for the anastomosis, nor is the operation prolonged and made more difficult when such a decision has been made.

Conclusions

The Billroth I method for gastric resection is an old and time-honored operation. It had been neglected for several decades, but it has been revived of late. Under properly selected conditions, it is an excellent operation that continues to yield a high incidence of eminently satisfactory results.

A Review of Billroth I Gastrectomy

TABLE I. AUTHOR'S EXPERIENCE—BILLROTH I TYPE GASTRECTOMY

	Total Cases—20
Indications	
Gastric ulcer	12
Duodenal ulcer	7
Gastric polyp	1
Deaths	
Postoperative	1
Unrelated	1
Lost to follow-up	2
Recurrence	0
Present known good results	16
Dumping	1 (mild)

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IN RECENT YEARS, there has been a revival of interest in and use of the so-called Billroth I type subtotal gastric resection, or more correctly, subtotal gastrectomy with gastroduodenostomy. The first gastrectomy was performed by the Frenchman, Jules Emile Péan, on April 9, 1879. He re-established continuity by gastroduodenal anastomosis. The second one was performed on November 16, 1880 by Ludwig von Rydygier. Both of these patients died in the immediate postoperative period.

The third recorded gastric resection was performed by Theodore Billroth on January 29, 1881, for carcinoma of the stomach. The patient survived the operation but died four months later due to diffuse hepatic and omental metastasis. The first two such operations performed by Billroth were done with the anastomosis on the lesser curvature side. However, later, Billroth changed to the greater curvature side for his anastomosis because he felt it would minimize the chances of stomal obstruction, this complication having caused death in his second operation.

Soon after 1881, the gastroduodenal anastomosis fell into disfavor. Its decline would seem largely due to the difficulty in preventing leakage in an anastomosis between the large gastric stump and the smaller end of the duodenum. On January 15, 1885, Billroth performed a prototype of what is now known as the Billroth II gastric resection. This found favor with most of the surgeons of that day, and for a long time satisfaction with this procedure seems to have contributed to failure to refine and overcome the technical problem of the Billroth I procedure.

In the early 1900's, Schoemaker began to remove much larger amounts of the lesser curvature of the stomach in order to gain a wider margin beyond gastric carcinoma. His method equalized the gastric and duodenal stump so that anastomosis could be satisfactorily carried out. It is the modification of Schoemaker that is in wide use today, although other modifications of the Billroth I, particularly those of Finney and Horsley, have enjoyed favor by some surgeons. For a more complete discussion of the history of the gastric resection, the reader is referred to the excellent monograph by Moore and Harkins[1] published in 1954.

On consideration of what type of gastric operations should be performed when resection is indicated, for a variety of reasons, the following factors would seem to indicate that the Billroth I might well be favored:

1. It is the most physiologic in that it removes the antrum and vagal stimulation and re-establishes continuity.

2. The ulcer is removed.

3. It should give the best protection against future complications. Harkins states that because of Brunner's glands, the duodenum is better equipped to resist acid pepsin. Dragstedt[2] has suggested that the duodenum naturally possesses greater mucosal resistance than the jejunum. Connelly, et al,[3] state that gastric secretion studies after three-fourths gastrectomy almost always show either no free hydrochloric acid or greatly reduced HCl and that marginal ulceration does not occur if the gastric pH remains above 5.0.

4. There is no blind duodenal stump and no afferent limb to become obstructed or form jejunocolic fistula.

5. The technique of the Billroth I is easier and can be performed entirely in the supracolic compartment of the abdomen.

6. It is faster because it reduces the time consumed in closing the duodenum and opening the jejunum as required in the Billroth II.

7. The nutritional status is better. Ellison, Cole and others[4] have shown that less nitrogen and fat is excreted in the stool after the Billroth I procedure than after the Billroth II. Wollaeger[5] has shown that a better weight gain occurs.

The presence of kyme in the duodenum gives maximal stimulation of secretion leading to bile and pancreatic secretion and thus along with the normal continuity promotes a better mixing of the digestive elements with food.

Lundh,[6] in a series of studies reported in Stockholm in 1958, stated that the superiority of the Billroth I anastomosis over the Billroth II anastomosis in nutritional respects seemed clearly shown from his studies and that in the Billroth I group are found the more favorable conditions for digestion and absorption in that part of the intestine where absorption and digestion normally take place.

8. There is slower emptying of the gastric remnant which results in less dumping syndrome.

Description of Procedure.—Since 1956, we have been performing subtotal gastrectomy with gastroduodenostomy wherever possible for a variety of indications and, in fact, in all cases which meet the following two requirements: (1) that the ulcer can safely be excised, and (2) that after seventy-five per cent resection of the stomach, anastomosis can be carried out without tension at the suture lines.

The procedure has been essentially the Schoemaker modification of the Billroth I resection carried out as follows: A left subcostal incision extending approximately two inches to the right of the midline is used. The stomach is delivered and the omentum divided from the peritoneal reflection on the duodenum to and including the most distal one or two vasa brevia except in cases of large gastric ulcers or obvious or suspected gastric carcinoma in which case the entire omentum is removed. The right gastric artery is divided, the lesser omentum entered and the duodenum freed up to a point beyond the ulcer which is possible in most cases but may necessitate mobilization of the second part of the duodenum by incision of the lateral peritoneal reflection. The duodenum then is transected and a clamp is left on the duodenum. Next, approximately 75 per cent resection is carried out, placing a clamp on the lesser curvature side at the level of the most distal vas brevis at a right angle to the curvature for a distance of 5 cm. Another clamp is then angled up to within 1 inch of the esophagastric junction and the distal stomach thus excised. The lesser curvature side of the cut end is then closed in two layers, using a running over-and-over hemastatic suture of No. 0 chromic followed by inversion with Lembert sutures of silk. Then, if the remaining 5 cm. open end of the stomach can be easily approximated to the cut end of the duodenum without tension, and indeed they usually overlap, an open two-layer anastomosis is carried out. In all cases, the left gastric artery is divided near its origin.

Gastric suction is utilized for the first twenty-four to forty-eight hours and the tube then removed. The patient starts first on clear liquids and gradually progresses to five or six small soft feedings daily by the fourth or fifth postoperative day. In contrast to the various modifications of the Billroth II procedure, we have had no cases in which gastric suction was necessary beyond seventy-two hours. During the time of suction, fluid and electrolytes are carefully watched and replaced as indicated.

My cases are few in number, but at least they serve as encouragement in greater use of this procedure. I performed twenty Billroth I gastric resections as described above since the latter half of 1953 with follow-ups varying from five years to six months. There were two deaths, one at fourteen days postoperative, due to myocardial infarction, in a man seventy-eight years of age who had

an otherwise uneventful postoperative course. Another death occurred at eighteen months of entirely unrelated circumstances and at the time of death the patient's nutritional course was good

per cent recurrence rate after resection for gastric ulcer and 9 per cent for resection for duodenal ulcer. Connelly, Lempka, et al,[3] in a series of 133 cases, report a 1.5 per cent mortality with no re-

TABLE II

	Total Patients	Gastric Ulcer	Duodenal Ulcer	Other—Incl. Mixed	Percent Dumping Incl. Mild	Mortality	Percent Excellent and Good Results	Recurrence		
								Gastric	Duodenal	Total
Goligher, Moir, Wrigley	148	0	148			4%			15%	15%
Harkins	451	118	248	85	5.3%	3%	96%	1	4	5(1.1%)
Localio	128	53	71	4	46%	0.8%		0	8	11%
Hickenbotham	276	132	100	19		2.7% Excl. Ca	99.2% (gastric) 80.5% (duodenal)	1(0.8%)	10	11.5%
Horsley and Barnes	207	97	110		0	8.7% 1.5% (since 1946)	85.3%	4.5%	5.5%	5%
Walters	237	32	146	59		1.2%	92% (gastric) 75% (duodenal) 100% combined	5%	9%	7%
Connolly, Lempka, et al	133	36	76	7	0	1.5%				0
Johnston, Weinberg	20	9	10	1		1 death				0
Durham	200	28	136	36	25% Most transient	1.5%	Less than 10% failed to regain	.5%	.5%	1%

with no complaints referable to the gastrointestinal tract. Two patients, who were lost to follow-up after slightly more than one year, were free of complaints and rated as excellent results at that time (Table I).

The indications for surgery in these cases were: gastric ulcer (12), gastric polyp (1), duodenal ulcer (7). Of the sixteen cases followed, thirteen have maintained or exceeded their preoperative normal weight and the remaining three have lost less than ten per cent of their preoperative normal weight. There are no proven or suspected recurrences at the present time. One patient, one year following surgery, had a short period of mild biliary regurgitation and at that time x-ray was negative for recurrent ulcer and now two years after surgery that patient is free of symptoms. One patient had a transcient episode of very mild dumping which was not disabling and was relieved by the usual conservative method. All patients have estimated their results as good or excellent. The summary of a number of reports or series to be found in the literature is presented in Table II. It is interesting to note that overall recurrence rates of ulcers run from 1 per cent to 15 per cent, the latter reported by Goligher[7] in a series of 148 duodenal ulcers. Walters, Lynan, et al,[8] reported a high recurrence rate occurring in 237 cases with 5

currences. While no effort here is made to compare directly recurrence rates between Billroth I and Billroth II procedures, certainly any recurrence rate above 5 per cent would reflect poorly when compared with the usually reported recurrence rate after Billroth II. I think that the study of the mortality rate will show that all cases are comparable when one takes into account the years in which the procedures were performed. In reporting 207 cases, Horsley and Barnes[9] showed an overall mortality rate of 8.7 per cent. However, in the cases performed since 1946, the mortality rate was only 1.5 per cent. Also in studying Table II, the wide range in evaluation of excellent and good results as well as the wide range in percentage showing some degree of dumping after the Billroth I is striking. Harkins, who perhaps has been one of the most enthusiastic advocates of the Billroth I procedure, favors a 75 to 80 per cent resection, and certainly his cases are striking. However, the criticism is often leveled at the fact that a large number of his follow-ups are of shorter length as compared to follow-ups in the series reported by Walters. However, Harkins does show a 5.3 per cent of dumping which includes mild cases, a mortality rate of 3 per cent, an overall 1.1 per cent recurrence rate, and 96 per cent of excellent or good results.

Hoar[10] has recently reported eighty cases of 85

to 90 per cent gastrectomy of which thirty-two patients had gastroduodenostomy. In these patients, all the lesser curvature and all but 2.5 inches of the greater curvature were removed. There were no recurrences of ulcer in his series with a follow-up of six months to three years. There was no mortality. Eighty-two per cent of the patients had excellent to good results. The remainder had fair results but were in no way incapacitated. Doctor Hoar concluded that the gastroduodenostomy was a far better procedure because 44 per cent of the patients with this anastomosis had no symptoms, while only 23 per cent of the patients with gastrojejunostomy had no symptoms, and dumping was less frequent and severe in the gastroduodenostomy group. He stated that this extent of the resection should lower the serum pepsinogen to the 200 tyrosine unit level and that in other reports marginal ulceration has been associated with levels above 300. It is his conclusion that if gastroduodenostomy is done for duodenal ulcer, at least 85 per cent of the stomach should be resected.

Summary

1. The theoretical considerations favoring the Billroth I procedure for peptic ulcer are briefly discussed.

2. A small series of twenty cases was reported without recurrent ulceration or serious morbidity. While the results are encouraging, the number is too small and the follow-up too short to be conclusive.

3. A number of series of Billroth I procedures reported in the literature are reviewed. In the light of the overall experience, it would seem that the following conclusions are warranted:

(a) The Billroth I procedure may well provide a better nutritional status for the patient.

(b) Because of the preponderance of evidence showing a high recurrence rate when this is performed for duodenal ulcer, this operation might best be reserved for those cases in which gastric ulcer is present or in which there is some overall reason weighing against performance of a Billroth II type procedure. There may be some evidence that 75 to 80 per cent resection will help protect against the increased recurrence rate following duodenal ulcer.

(c) Fifty per cent gastrectomy with gastroduodenostomy and vagotomy may ultimately offer a superior surgical approach to this complex problem.

Dragstedt, in a recent editorial in *Archives of Surgery*, maintained that his work on the intestinal phase of gastric secretion suggested from the physiological point of view that the Billroth I operation is superior to the Billroth II for acid media entering the duodenum from the stomach inhibit gastric secretion and thus tend to negate the intestinal phase. However, when the food from the stomach enters the jejunum directly, the intestinal phase of secretion is stimulated.

Bibliography

1. Moore, H. G. and Harkins, H. N.: Billroth I Gastric Resection. Little Brown & Co., 1954.
2. Dragstedt, L. R.: Editorial. Arch. Surg. Vol. 78. No. 3 (Mar.) 1959.
3. Connolly, E. A., Lempka, A. W., and Orgen, C. H.: An evaluation of gastroduodenostomy. Ann. Surg., 146:No. 2 (Aug.) 1957.
4. Ellison, E. H.: Nutritional problems following gastric resection. Surg. Clin. North America, 39: 1955.
5. Wollaeger, E. E.: Disturbances of gastrointestinal function following partial gastrectomy. Post Grad. Med., 8: 1950.
6. Lundh, G.: Intestinal digestion and absorption after gastrectomy. Acta Ch. Scand., Supplement 231, 1958.
7. Goligher, J. C., Moir, P. J., and Wrigley, J. H.: Billroth I and Polya operations for duodenal ulcer. Lancet, I: 1956.
8. Walters, W., and Lynan, T. E.: Results of 237 Billroth I gastric resections for peptic ulcer. Ann. Surg., 144:No. 3 (Sept.) 1956.
9. Horsley, C. W., and Barnes, W. C.: Twenty-five years of experience with Billroth I gastric resection. Ann. Surg., 145:No. 5 (May) 1957.
10. Hoar, C. S., Jr.: Radical subtotal gastrectomy for peptic ulcer disease. Arch. Surg., 78:No. 3 (March) 1959.
11. Durham, M. W.: Billroth I resection. Northwest Med., 55:No. 12 (Dec.) 1956.
12. Johnston, P. W., and Weinberg, J. A.: Billroth I resection for peptic ulcer. California Med., 84: No. 3 (March) 1956.
13. Kenar, E. A., et al: The Billroth I subtotal gastric resection. Arch. Surg., 72:No. 6 (June) 1956.
14. Localio, A. S., and Dwyer, W.: Results of adequate gastrectomy with gastroduodenostomy. Surg. Gynec. & Obst., 108:No. 2 (Feb.) 1959.
15. Hickenbotham, P.: The Billroth I gastrectomy. Brit. J. Surg., 44:No. 184 (Sept.) 1956.

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Juvenile Rheumatoid Arthritis

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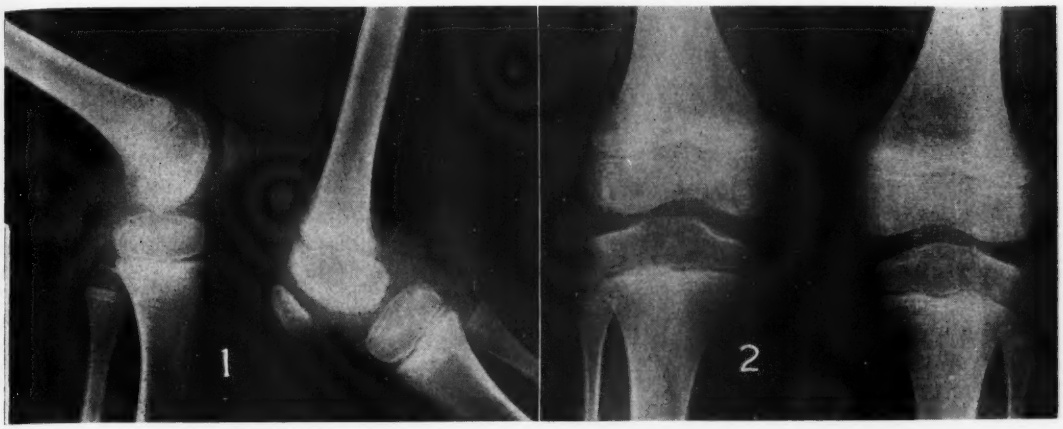
Fig. 4. Roentgenogram of cervical spine and jaw of a girl, age eighteen, illustrates the failure of normal mandibular development.

From the University of Buffalo College of Medicine, Arthritis Clinics of the Buffalo Children's Hospital and Buffalo General Hospital. This paper is published in greater detail in "Progress in Arthritis," Grune & Stratton.

Many reports on juvenile rheumatoid arthritis paint a particularly black picture because of experience with hospitalized patients. This report of sixty-two patients from a combined out-patient and hospital experience gives encouragement about the prognosis in patients receiving conservative therapy.

IN 1897, Still reported such unusual findings in children with rheumatoid arthritis that he believed they constituted a distinct disease (Still's disease).[1] Girls were more frequently affected than boys. The onset was usually insidious with a continuous low or intermittent fever, and not related to joint symptoms. Profuse sweating and mild anemia were common. The characteristic clinical findings included retarded physical growth, marked muscle wasting and absence of joint pain. The joints most frequently involved were the knees, wrists and cervical spine. Still attached much importance to enlargement of the lymph nodes and splenomegaly, the absence of osseous and cartilagenous changes, and involvement of serous membranes (pericarditis and pleurisy). These findings constituted the chief argument in establishing a new clinical entity.

It is difficult to believe that there is any valid reason to consider "Still's disease" as a different



Figs. 1 and 2. Roentgenograms of the knees in a boy, age eight, demonstrate the "wooly" subchondral bone outgrowths of early rheumatoid arthritis.

Presented in the annual postgraduate course, University of Buffalo, September 14, 1959, and the American College of Physicians postgraduate course, October 5, 1959.

entity than rheumatoid arthritis. Bone and cartilagenous destruction do occur and there is no fundamental difference in the anatomical or pathological lesions of "Still's disease" and rheumatoid arthritis. Many gradations of severity of the disease develop in recurrent attacks. Moreover, one of the distinctive findings in juvenile rheumatoid arthritis, that is, abnormal bone development, is merely the result of the disease upon the growing epiphyses. Because only a few large series of patients have been reported, marked discrepancies exist in the knowledge of the course and result of the disease in the average patient. We hope to clarify some of these differences in the following report.

Incidence

If one judged by the paucity of large series of juvenile patients in the medical literature,[2-12] it would be reasonable to assume that this disease is rare. However, it is our experience that rheumatoid arthritis in children is more frequent than previously believed. In a twenty-year period (1935-1955), eighty patients with juvenile rheumatoid arthritis were observed by us, an incidence of 2.7 per cent of all cases of rheumatoid arthritis. Since this group includes ambulatory office patients as well as hospitalized patients, we believe that it represents a faithful picture of the average incidence and course of this disease. The results are based upon the course of the disease in sixty-two children who have been studied periodically for more than seven years.

Sex and Familial Incidence

In universal agreement as to the greater frequency of juvenile rheumatoid arthritis in the female sex, most authors have determined the ratio to be two to one,[2,4,5,12,13] which coincided with our group of forty-one females and twenty-one males. A familial occurrence of rheumatoid arthritis or rheumatic fever, as high as 30 per cent,[2,7,8] has been demonstrated in several series. However, we found only six patients (10 per cent) who had close relatives with rheumatic fever or rheumatoid arthritis.

Age of Onset

General agreement places the peak incidence of onset before or during the third year, followed



Fig. 3. Roentgenogram of the wrists in a boy, age ten, demonstrates abnormal carpal development.

tions should be considered only as a precipitating, rather than the causative factor. The frequency of respiratory disease (especially due to hemolytic streptococci) just prior to the onset of rheumatoid arthritis is almost as impressive as in patients with rheumatic fever. In several reported series, the incidence of prior respiratory infections varied from 45 to 57 per cent.[2,6,10] In our series, 35 per cent of the patients had a history of an antecedent respiratory infection with hemolytic streptococci recovered from the throats of all except three.



Figs. 5, 6, 7, 8. Roentgenograms of the pelvis illustrate the progressive arthritic changes and malformation of the left femoral head and acetabulum in a boy from age six to seventeen.

by a secondary rise between the eighth and eleventh years of life.[2,4-7,13] In our series, onset occurred before the third year in 56 per cent, and symptoms first appeared between the eighth and eleventh years in 30 per cent. In one patient, our youngest, the disease began during the tenth month. This case is not unusual since Sury[4] reported eight patients who developed their disease during the first year. Patients over twelve years of age at onset were not included because they reacted in a pattern typical of the disease in adults.

Precipitating Factors

Since the etiology of rheumatoid arthritis is not known, it is believed that upper respiratory infec-

In our opinion, trauma to a joint is of questionable etiologic significance (less than 10 per cent of our patients). We believe it is only coincidental and not the cause of rheumatoid arthritis in children. The possible relationship of a hereditary factor in juvenile rheumatoid arthritis was not apparent in our group.

Type of Onset

The mode of onset was insidious in forty-six (74 per cent) of the patients with painless swelling of one or more joints and minimal constitutional reaction. Fever, anorexia, weight loss and anemia were mild but were observed in ten of this group. In the remaining sixteen patients (26 per cent),

TABLE I. SYSTEMIC MANIFESTATIONS IN TWENTY-SIX PATIENTS

Fever	26
Anemia	23
Weight loss	22
Interference with osseous growth	12
Carditis	12
Lymphadenopathy	10
Splenomegaly	9
Hepatomegaly	5
Ocular involvement (scleritis, iridocyclitis)	5
Paralytic ileus	1

the onset of the disease was acute, with severe and impressive symptoms. This group of children developed high or prolonged fever, severe anemia requiring transfusions, cardiac abnormalities, marked weight loss, enlargement of the spleen, lymph nodes and liver. They were seriously ill, had a protracted illness with frequent recurrences, and usually experienced a poor final result.

TABLE II.

Joint First Involved		Later Involvement During Course of Disease	Total Involvement
Knee	36	22	58
Hand	5	32	37
Wrist	7	25	32
Ankle	4	26	30
Elbow	0	20	20
Foot	4	10	14
Hip	3	9	12
Cervical spine	1	10	11
Shoulder	0	9	9
Sacro-iliac	1	4	5
Temporo-mandibular	1	4	5
	62		

Constitutional Reactions

Systemic manifestations were present in twenty-six of our patients (40 per cent). The systemic findings and their incidence are shown in Table I.

TABLE III. ACTIVITY OF RHEUMATOID ARTHRITIS

	Number of Patients		Duration of Activity
One period only (forty-one patients)	17 18 6		1-2 years 3-6 years 7-10 years
	Patients	Number of Attacks	Duration of Activity
Multiple periods of activity (twenty-one patients)	9 6 4 2	2 3 4 5	3 to 20 years

Loss of weight was a frequent early finding but usually approached normal when the activity of the disease subsided. Failure of normal growth was observed in six patients, but two regained normal height when the disease became inactive. Four patients had permanent defects as a result of premature epiphyseal fusion or because of accelerated growth.



Fig. 9. Roentgenogram of the same boy at age seventeen illustrates the failure of normal mandibular growth and also fusion of the posterior articulations of the second and third cervical vertebrae.

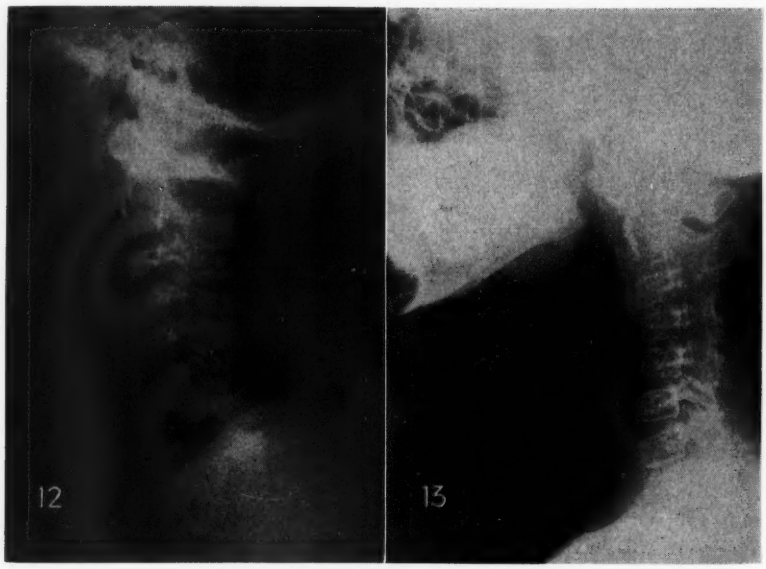
The occurrence of murmurs, friction rubs and electrocardiographic abnormalities was observed in twelve patients; two patients developed cardiac failure during acute episodes. Postmortem findings of severe pancarditis (similar to rheumatic fever) were present in two of the three fatalities. Six of the twelve patients later revealed no evidence of cardiac involvement, but the three remaining patients have developed valvular disease (two aortic and one mitral stenosis).

Initial Joint Involvement

Juvenile rheumatoid arthritis had a predilection for initial involvement of large joints, especially the knee, in younger patients. In older children who are approaching puberty, there is a higher incidence of initial involvement of small peripheral joints, similar to adult patients. Frequency of joint involvement in our group of sixty-two children is tabulated in Table II.



Figs. 10 and 11. Roentgenograms of the knees in a girl, illustrate the marked progression of arthritis from age seven to ten.



Figs. 12 and 13. Roentgenograms of the cervical spine in the same girl, demonstrate fusion of the second to the fifth cervical vertebrae and subluxation at C5 and C6 (age seven to twelve).

In six patients (9 per cent), only one joint was involved during the course of the disease. Monarticular involvement of the knee occurred in four patients; the hip and ankle joint were affected in the other two patients. Four patients had migratory joint symptoms resembling rheumatic fever, before definite evidence of rheumatoid arthritis was apparent.

Duration of Activity of the Disease

The average duration of activity was five and one-half years in our patients, but recurrences of the disease were observed for periods as long as twenty years. Forty-one patients (66 per cent) had only one period of activity while twenty-one patients (33 per cent) had multiple periods of activity.

Reactivation of the disease followed upper respiratory infection due to H. streptococci in seven patients. Severe trauma produced a recurrence in three patients after the disease had been inactive in two persons for ten and twelve years. One patient had a recurrence of the disease following pregnancy after sixteen years of quiescence.

Differential Diagnosis

Juvenile rheumatoid arthritis was confused with other diseases in more than one-third of our patients. The greatest difficulty occurred in the differential diagnosis of rheumatic fever in twelve patients. The clinical picture of rheumatoid arthritis rapidly became apparent in eight patients, although six subsequently developed cardiac lesions. In six patients with monarticular involvement, it was possible to exclude specific infectious arthritis (especially tuberculosis) by means of aspiration of a joint and culture of the fluid, tuberculin test, and biopsy of the synovia. Leukemia was considered presumptively in three patients and osteomyelitis was suspected in two patients.

Treatment

Treatment of juvenile rheumatoid arthritis does not differ from that of adults. This program employs the same fundamental measures of bed rest, physical medicine, supportive therapy for general health, orthopedic procedures to prevent or correct deformities, and in some patients, the administration of gold salt or hormones. The most effective treatment in our experience has been prolonged bed rest in combination with injections of gold salts and physical therapy, when this program can be carried out intelligently in the pleasant atmosphere of the home. Complete bed rest is continued until all evidence of joint inflammation has subsided.

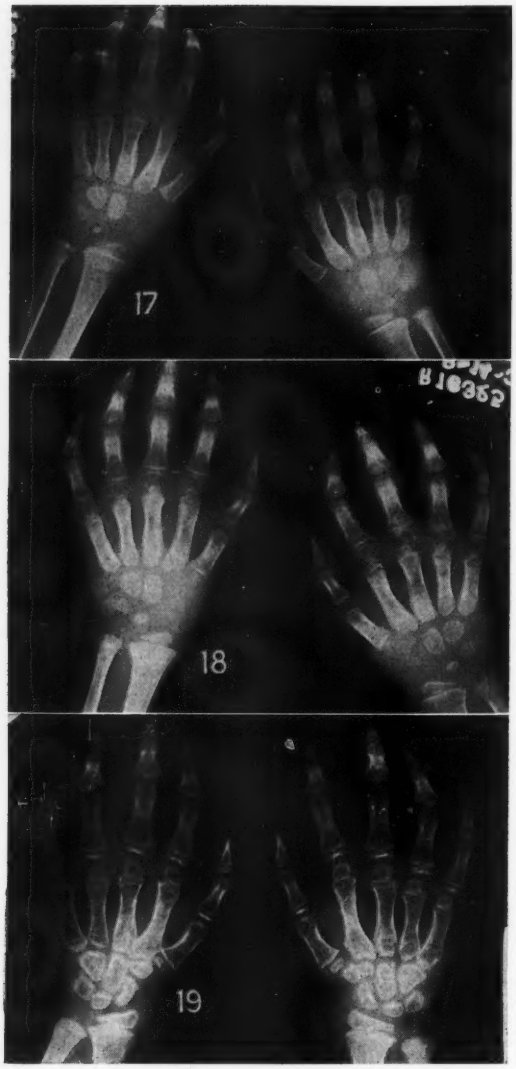
The evaluation of drugs (chrysotherapy or hormones) is difficult because the disease is often self-limited and subject to remissions or recurrences. Chrysotherapy was administered to thirty-five patients (weekly injections of 10 to 20 mg. until a total of 600-900 was given); twenty-three patients (65 per cent) improved during the period of gold treatment. In twenty patients, corticotrophin or adrenal corticosteroid therapy was given. All patients had prompt relief of constitutional and arthritic symptoms, and suffered no serious side effects. There can be no question but that hormone therapy diminished the severity of the disease in every patient. The only discouraging factor was the radiographic demonstration of progressive arthritic changes in five patients, despite marked clinical improvement. However, it is our belief that hormones are of benefit in juvenile rheumatoid patients with severe involvement of joints and constitutional symptoms. Hormone therapy was not used in patients with mild juvenile rheumatoid arthritis for they responded well to conservative therapy and chrysotherapy.



Figs. 14, 15, 16. Roentgenograms of a girl, illustrate the severe arthritic deformities that resulted in a seven year period following onset at age seven. There is fusion of both hips, knees, ankles, feet, wrists, and hands. Premature fusion of one epiphysis with stimulation and overgrowth of the other produced bizarre deformities of both the upper and lower extremities.

Prognosis and Results

The prognosis of juvenile rheumatoid arthritis in this group was not as pessimistic as the original



Figs. 17, 18, 19. Roentgenograms of a boy, age three, demonstrate the periosteal accretion of bone in the phalanges during a five month period and resorption of the new bone eighteen months later.

description by Still[1] or the recent report by Barkin[2] would indicate. An explanation for the "poor" results is that their series included a high incidence of severe cases requiring hospital care and excluded the mild patients encountered in office practice.

Factors Which Affect Prognosis

The prognosis of juvenile rheumatoid arthritis was unfavorably influenced in patients with prolonged duration of activity or an acute onset with severe constitutional reaction to the disease. There was no apparent relation of the ultimate prognosis to the age at onset or to the sex of the patient.

Cause of Death

Three patients have died. In addition to severe rheumatoid arthritis, pancarditis and amyloidosis, one had pulmonary tuberculosis, and the second had staphylococcus septicemia with multiple abscesses. The third who died in another hospital of an acute, exsanguinating hemorrhage (at her menarche) did not have an autopsy but was believed to have amyloidosis and carditis on previous examinations.

TABLE IV.
FUNCTIONAL CAPACITY AT RECENT EXAMINATION

	Number of Patients	Total Patients	Percentage of Total Patients
Normal functional capacity			
Class I			
Inactive	23		
Active	3	26	41.9%
Class II			
Inactive	14		
Active	8	22	35.5%
		48	77.4%
Limited functional capacity			
Class III			
Inactive	6		
Active	2	8	12.9%
Class IV			
Inactive	2		
Active	1	3	4.8%
Died	3	3	4.8%
		14	22.5%

Interference with Normal Osseous Growth

Complex and bizarre effects were observed on the normal pattern of osseous growth. These changes include premature fusion of epiphyses with failure of normal bone growth, stimulation of epiphyses with excessive growth, periosteal growth along the shaft of the phalanges, and abnormalities resulting from a combination of these factors and the arthritic process.

Table V lists the regions of the osseous growth disturbances in twelve patients (20 per cent).

Summary

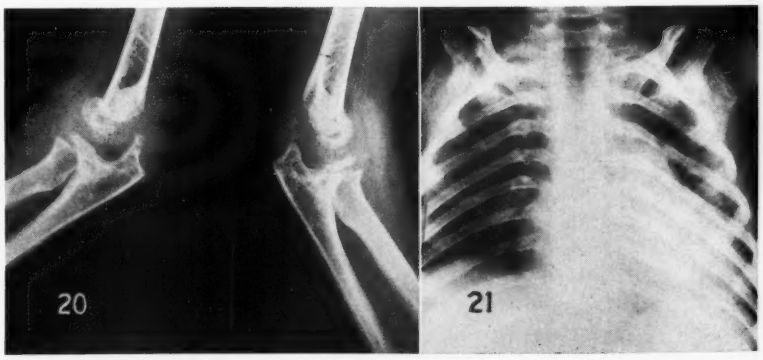
Juvenile rheumatoid arthritis is a chronic joint disease of children associated with systemic manifestations in 40 per cent of the patients. The peak incidence occurs during the first three years of life, with a secondary rise between the eighth and eleventh years. The most important precipi-

tating cause of the disease is a preceding respiratory infection (when associated with the hemolytic streptococcus).

The course of juvenile rheumatoid arthritis is variable. The disease is often mild with a duration of less than two years in 25 per cent of the patients. Joint and systemic involvement are severe in another 25 per cent of the patients and the disease may continue to be active with frequent recurrences for twenty years or more. The average duration of activity was five and one-half years after onset in this series.

The ultimate prognosis of the disease was determined by the type of onset and by the duration of activity or frequent recurrences. The sixteen patients (25 per cent) who had an acute onset with severe constitutional symptoms suffered the poorest result. The prognosis for functional recovery is good (77 per cent). Abnormal bone development resulted from the effect of the arthritic process on the growing epiphyses in approximately 20 per cent.

The treatment of juvenile arthritis is the same as in the adult form of rheumatoid arthritis. Prolonged bed rest combined with chrysotherapy and adequate physical therapy produced the best results. The judicious use of hormones definitely reduced the morbidity of the disease in severely involved patients. When hormone therapy was carefully eliminated, no exacerbations of the disease were encountered.



Figs. 20 and 21. The severe destructive changes of the elbow joints and the marked cardiomegaly are illustrated in the same boy at age five.

TABLE V. OSSEOUS GROWTH DISTURBANCES

1	Cervical vertebrae	8
2	Mandibles	7
3	Hands and wrists	7
4	Hips	5
5	Disproportionate growth in one extremity	4
	a. Forearm	4
	b. Leg	3

Bibliography

1. Still, G. F.: On a form of chronic joint disease in children. Medicochirurgical Trans., 80:47, 1897.
2. Barkin, R. E.: The clinical course of juvenile rheumatoid arthritis. Bull. Rheumat. Dis., 3:37, 1952.
3. Bille, B.: Kronisk polyartrit hos barn och dess guldbehandling. Nord. Med., 37:307, 1948.
4. Sury, B.: Rheumatoid arthritis in children—A clinical study. Münksgaard, 1952.
5. Colver, T.: The prognosis in rheumatoid arthritis in childhood. Arch. Dis. Childhood, 12:253, 1937.
6. Coss, J. A., and Botts, R. H.: Juvenile rheumatoid arthritis: Study of fifty-six cases with a note on skeletal changes. J. Pediat., 29:143, 1946.
7. Edstrom, G.: Rheumatoid arthritis in children. Acta Pediat., 34:339, 1947.
8. Fyfe, W. M.: Rheumatoid arthritis in childhood. Glasgow M.J., 36:102, 1955.
9. Holzmüller, G.: Beitrag zur frage der pathogenese und therapie der primärchronischen galenkerkrankungen im kindesalter. Ztschr. F. Rhemaforsch., 5:57, 1942.
10. Pickard, N.: Rheumatoid arthritis in children: A clinical study. Arch. Int. Med., 80:771, 1947.
11. Wissler, H.: Der Rheumatismus im Kindesalter. Tail 2: Die. Chronische Polyartritis des Kindes, 152, Dresden und Leipzig, 1942.
12. Lockie, L. M., and Norcross, B. M.: Juvenile rheumatoid arthritis. Pediatrics, 2:694, 1948.
13. Bunim, J. J., Kuttner, A. G., Baldwin, J. S., and McEwen, C.: Cortisone and corticotropin in rheumatic fever and juvenile rheumatoid arthritis. J.A.M.A., 150:1273, 1952.

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Ectopic Pregnancy

A Report of 219 Cases

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ECTOPIC pregnancy, by definition a gestation occurring outside the uterine cavity, may be met by the gynecologist as an acute and obvious emergency, or it may present a difficult diagnostic problem. Frequently a ruptured corpus luteum cyst, threatened intrauterine abortion, or pelvic inflammatory disease may most successfully mimic this condition. In recent years the more widespread use of such techniques as culdocentesis, culdoscopy and colpotomy, as well as the attitude of "ectopic awareness," has materially aided in effective diagnosis and treatment.

Ectopic pregnancy may occur in the tube, ovary, abdominal cavity or in the cervix. There will be different clinical symptoms, depending upon the site involved. Within the tube, nidation may take place in the ampullary, isthmial, or interstitial segments. Ampullary involvement may either terminate by rupture or by abortion through the end of the tube. Isthmial implantation will almost invariably result in early rupture due to the restricted diameter of the tubal lumen. Finally, involvement of the interstitial portion may rupture into the uterine cavity, into the abdominal cavity, or into the broad ligament. The development of an ovarian, abdominal or cervical implantation is a most infrequent occurrence.

Material

During the ten year period ending January 1, 1958, there were 219 patients, in whom ectopic pregnancy was proved at surgery, were admitted to Barnes and the St. Louis Maternity Hospitals. There were no mortalities. During this period, there were 40,361 deliveries giving an incidence of 1:184 (0.54 per cent). Others have noted a somewhat higher incidence, 0.93 per cent,[1] 0.77 per cent,[2] 0.74 per cent,[3] 0.72 per cent,[4] and 0.62 per cent.[5]

Etiology

Any factor which prevents or delays the passage of the ovum to the uterine cavity may be responsible for ectopic gestation. Infections, secondary to abortions, post-partum endometritis, or gonorrheal salpingitis may impede passage of the ovum by adhesions or luminal kinking of either the intimal or serosal surfaces of the tubes. Previous pelvic surgery, peritonitis, or endometriosis may also set the stage for ectopic pregnancy. Usually these situations provide partial obstruction from involvement of the serosal rather than the mucosal tubal elements. Transmigration of the ovum from one ovary to the opposite tube has been noted in a significant number of cases. The resulting ectopic implantation is thought to

be due to the advanced development in size of the ovum as a result of delay during migrational activity. Congenital malformations, such as bicornuate uteri with rudimentary horns, as well as the clinically nebulous diagnosis of tubal spasm, may prevent normal progress of the ovum toward the endometrial cavity implantation site.

A relatively high incidence of previous salpingitis in cases of ectopic pregnancy has been reported in the literature. Carrabba and Silberblatt,[2] noted an incidence of only 18 per cent, however, others have noted 27 per cent,[6] 28 per cent,[7] and 29 per cent.[8] In the present study, fifty-seven cases (26 per cent) either gave a history of previous pelvic inflammatory disease and/or had evidence of it at surgery.

Bookrajian and Luther,[6] have reported the incidence of previous lower abdominal laparotomy in 10 per cent of subsequently developing ectopic pregnancies, contrasted with the 30 per cent, as noted by MacFarlane and Sparling.[9] In the present series, a positive history of previous pelvic surgery was obtained in fifty cases (22 per cent).

A positive history of previous abortions has been reported[10] with an incidence ranging from 15 to 32 per cent of the cases. The present series developed a 31 per cent incidence of previous abortion. In addition, 5 per cent of the patients had repeat ectopic pregnancies. This agrees well with other reports.[2,6,7,8,9,11,12]

Transmigration of the ovum was observed in almost a third of the cases previously reported from this institution.[13] In the present study, twenty-one cases, or 21 per cent of those cases in which this observation was made, were found to contain the corpus luteum of pregnancy in the opposite ovary.

Age

Ectopic pregnancy may occur at any time during a woman's reproductive years. However, the greatest incidence has been noted repeatedly to be in the age group of twenty-six to thirty-five years.[2,4,6,14,15] Findings in the present study agree well with those in the literature in that 132 patients (60 per cent) were between twenty-six and thirty-five years, with the youngest eighteen and the oldest forty-four years.

Parity

It has generally been observed that ectopic pregnancy occurs more commonly in patients of low parity. Bookrajian and Luther[6] found that 67 per cent of their patients were para ii or less. Douglas and associates[14] also noted that 65.7 per cent of their patients fell into this group. Our findings were comparable in that 68 per cent were para ii or less.

Physical Symptoms

The typical triad of ectopic pregnancy symptoms consists of pain, amenorrhea, and vaginal bleeding. Of these, pain is the most frequent symptom. Farell and Scheffey[16] noted pain in 100 per cent of their cases, whereas others have recorded 98.5 per cent,[11] 98.4 per cent,[6] 98.7 per cent,[2] 94 per cent,[8] 90 per cent.[7] The complaint of pain was absent in only 5.6 per cent of cases previously reported from this institution.[13] In this study (96 per cent of patients described some pain) approximately half the complaints were recorded as being severe and/or cramping. Pain was localized to one of the lower quadrants in 56 per cent. While the complaint of pain does not have to be present, its absence certainly casts doubt on the diagnosis.

The pain symptom complex varies considerably. The symptoms may be described as sharp and stabbing, dull and aching, or any variant of these basic patterns. There may or may not be complaints of the cramping type of distress. Usually the pain is confined to one of the lower abdominal quadrants. However, the distress may be bilateral, or even generalized over the entire abdomen. Quite frequently the pain complex may be referred into the back, the rectum, the diaphragm, or to the shoulders as the result of peritoneal irritation. Shoulder pain has variously been reported as 0.7 per cent,[7] 8.5 per cent,[11] 11.3 per cent,[12] and 26 per cent.[2] In this series, fifty-three patients (24 per cent) described this referred complex symptom. Half of the patients noted unilateral shoulder pain only, usually on the same side as the involved fallopian tube.

Menstrual irregularity is certainly the second most common finding in the clinical picture of ectopic pregnancy. The typical history is one of a missed period followed two to three weeks later by vaginal spotting with the subsequent onset of pelvic pain. Amenorrhea of over one month's duration was noted in 144 patients (65 per cent), and intermenstrual bleeding in 185 cases (84 per cent). A combination of both a period of ame-

norrhea followed by intermenstrual bleeding was noted in 125 patients (57 per cent). These observations agree well with those reported in the literature in regard to amenorrhea, 42.5 per cent,[1] 52 per cent,[17] 64.5 per cent,[11] 75 per cent,[8,9] and in intermenstrual bleeding, 90 per cent,[9] 87 per cent.[4] It has often been stated that the vaginal bleeding of ectopic pregnancy is mild in comparison to that of abortion. While this is a good rule of thumb, it should not be relied upon completely, as the vaginal bleeding may be quite profuse subsequent to death of the ectopic gestation, and the loss of decidua from the intrauterine cavity.

Syncope and weakness have been recorded in up to 40 per cent of the cases in the literature: 3 per cent,[18] 12.5 per cent,[1] 17 per cent,[16] 25 per cent,[2] 29.1 per cent,[11] 35.4 per cent,[9] 36.4 per cent,[17] and 40.8 per cent.[6] These symptoms were recorded in 44 per cent of the present series, 17 per cent of whom noted syncope.

Symptoms of pregnancy, with some part of the typical triad of nausea and vomiting, breast changes and increased frequency of urination were present in 50 per cent of the cases studied. Breast changes occurred in 61 per cent, nausea and vomiting in 58 per cent, and increased frequency of urination in 39 per cent.

Physical Signs

A number of findings on physical examination in ectopic pregnancy are worthy of note. Abdominal tenderness has been noted to be present in all the cases reported by Davis and Malloy,[1] while others have noted 93 per cent,[16] 90 per cent,[8] and 81 per cent.[17] This complaint was recorded in 196 patients (89 per cent) of those studied to develop this report.

Tenderness of the cervix on motion has been regarded as a valuable sign in ectopic pregnancy. Crawford and Hutchinson,[8] reported this in 31.6 per cent, and Bookrajian and Luther,[6] in 44 per cent of cases. Cervical tenderness was recorded in 41 per cent of the cases in this study.

Uterine enlargement was noted in 47 per cent of our patients. However, others have reported 12.5 per cent,[1] 25 per cent,[8] 29 per cent,[16] and 46.3 per cent.[9]

Cervical signs of pregnancy were found to be present in one half of our cases. Cervical softness was present in 39 per cent, and a positive Chadwick's sign was noted in 31.5 per cent.

Fullness of the cul-de-sac was noted in 58 per cent of our patients. Langman and Goldblatt[10] also noted this in over 50 per cent of their cases.

Laboratory Determinations

Whereas others[8] have noted positive pregnancy tests in as high as 75 per cent of instances, no more than 50 per cent of the present series recorded positive pregnancy tests. For this reason, we feel that the frog test is of little value in ectopic pregnancy. If positive, it may lend support to a considered diagnosis of ectopic pregnancy. However, no reliance should be placed upon a negative pregnancy test. Under no circumstances should a diagnosis of ectopic pregnancy be rejected purely on the basis of a negative pregnancy test.

Hemoglobin and red cell counts are of significance primarily when repeated tests over a period of observation show decreasing values. Occasionally the presence of an anemia, with a hemoglobin of under 10 grams (demonstrated in only 39 per cent of the cases studied), may be of value in defining the overall clinical picture.

Crawford and Hutchinson[8] noted a leukocyte count of over 10,000/c.mm. in 90 per cent of their 132 cases, with only 12 per cent being over 20,000/c.mm. Leukocyte counts in our cases revealed that 68 per cent had less than 12,000/c.mm. and 84 per cent less than 15,000/c.mm.

Procedures

Temperatures were recorded prior to surgery in all but thirteen patients. A temperature of 37.5° C or less was found in 80 per cent, with 95 per cent having a temperature of less than 38° C. This agrees well with the values noted by others.[8]

One of the most definitive tests for ectopic pregnancy is that of culdocentesis. This was carried out in 103 cases, with positive results in 92 per cent. Others[8] have reported a similar incidence. The procedure is simple and can be performed in the outpatient clinic without difficulty or complications.

Colpotomy is a valuable diagnostic as well as a therapeutic procedure. Occasionally, in those cases in which the diagnosis is borderline with a negative culdocentesis, a colpotomy may be performed, with a minimum of operative trauma to the patient. If present, the tubal pregnancy

may frequently be removed through the colpotomy incision. This procedure was carried out in only six of our cases.

Culdoscopy is also a useful procedure in ectopic pregnancy, and has its primary use in the patient with longstanding symptoms. This procedure was used in only two cases in this series.

A diagnostic dilatation and curettage was performed in forty-seven cases with a decidual reaction noted in 45 per cent and normal interval endometrium in 35 per cent. Crawford and Hutchinson,[8] noted a decidual reaction in 27 per cent of their cases.

Occasionally, it is necessary to do an examination under anesthesia in order to reassure the operator that he is making the proper diagnosis. This is particularly true in those patients who are experiencing too much pain or are too obese for an adequate pelvic examination. This procedure was carried out in 55 per cent of the cases. If the diagnosis of ectopic pregnancy is entertained on the basis of positive history or physical findings, it is up to the physician in charge to make a definitive diagnosis regardless of the extent of the laboratory or diagnostic procedures deemed necessary to satisfy his medical curiosity.

Diagnosis

The diagnosis of ectopic pregnancy is at best a difficult task. So many conditions may mimic this disease that only constant awareness of the possibility of its presence will be of assistance in making a correct diagnosis. In short, any physician dealing with women in the childbearing ages should be "ectopic conscious."

A differential diagnosis of ectopic pregnancy should include consideration of (1) corpus luteum cyst, (2) pelvic inflammatory disease, (3) threatened abortion, (4) ovarian cyst with twisted pedicle, and (5) appendicitis. Of course many other conditions may also develop symptoms similar to those of ectopic pregnancy. However, the clinical concerns listed above are the most prevalent situations that may be confused with the primary diagnosis.

Whenever the diagnosis of ectopic pregnancy is strongly suspected, certain procedures should be carried out in order to establish the diagnosis. A hemoglobin and/or hematocrit should be determined to detect any existing anemia, and also to serve as a baseline for further evaluation of later blood loss. Leukocyte counts and evaluation of the temperature serve to differentiate any infectious processes. Of major importance is the performance of a culdocentesis. Aspiration of non-clotting blood from the cul-de-sac usually narrows the diagnosis to either an ectopic pregnancy or a ruptured corpus luteum cyst with intra-abdominal hemorrhage. Both of these conditions may necessitate surgical intervention to determine the source and amount of hemorrhage.

The incidence of correct preoperative diagnosis of ectopic pregnancy in the literature is slightly over 80 per cent.[4,8,11,14] In the present series 193 patients (88 per cent) were correctly diagnosed preoperatively. In 104 of these cases, the diagnosis was so obvious that only the diagnosis of ectopic pregnancy was considered.

Operation

The presence of shock preoperatively has been noted in a varied percentage of cases. Bookrajian and Luther[6] recorded shock in 35 per cent, whereas Carrabba and Silberblatt[2] noted this in only 10 per cent. Others have noted 15 per cent,[4] 21 per cent,[16] 25 per cent,[9] 27.5 per cent,[1] and 33 per cent.[7] A blood pressure (systolic) of less than 100 was noted in eighty-eight (40 per cent) of the cases in this series.

In 158 cases, the amount of abdominal bleeding was estimated at the time of operation. Less than 500 cc. of blood were encountered in 55 per cent of these cases. Crawford and Hutchinson[8] also noted less than 500 cc. present in 47 per cent of their cases, with 26 per cent having over 1000 cc.

As may be expected from the foregoing data, transfusion became a necessity in 61 per cent of the patients, of whom two-thirds required multiple transfusions. As a general rule of thumb, if a patient needs transfusion during the course of an ectopic pregnancy, one unit (500 cc. whole blood) will not be sufficient for adequate patient protection.

Laparotomy was performed on the day of admission in 139 cases (63 per cent), while in another fifty-one cases (23 per cent), it was carried out within a second twenty-four hours after admission. Because of the uncertainty of the diagnosis, the remaining 14 per cent of patients were observed for varying periods up to a week before surgery was performed.

Throughout the literature it has been noted that ectopic pregnancy occurs predominantly on

the right side; 64 per cent,[14] 63 per cent,[9] and 53 per cent,[8,19] The preponderance of right-sided involvement was again demonstrated in this study, with 61 per cent occurring on the right side. Tubal abortion or rupture was also more prevalent on the right side (61 per cent). In four cases evidence of an old ectopic pregnancy was found on the opposite side from the side of acute symptomatology.

The most common site of involvement is generally stated to be in the ampullary portion of the tube.[7,8,9] In the series under consideration, the ampullary portion was involved in 77 per cent, the isthmial in 10 per cent, and 7 per cent were found in the cornual area. In the remainder of cases, the site of implantation was either not recorded or could not be determined from the pathologic report.

The operative procedure most commonly performed was the removal of the involved tube only, with preservation of the ovary whenever possible. Unilateral salpingectomy was done in 144 cases (66 per cent). Removal of both the tube and the ovary, often because of adhesions and involvement of the ovarian blood supply, was carried out in fifty-three patients (24 per cent). In 7 per cent, a partial salpingectomy, and in 1.5 per cent, a tuboplasty was performed in well-localized ectopics without extensive involvement of the tube. In one case, ligation alone was performed, and in one other the tube was milked and left intact. Bilateral salpingectomy was carried out in sixteen cases, for coexisting old ectopics, dermoid cysts, hydrosalpinx, and as part of the procedure during hysterectomy for myomatous uterus and cervical cancer.

The appendix was removed in forty-eight cases (22 per cent), once for subacute appendicitis, the remainder as incidental procedures. This is a relatively high rate of incidental appendectomies, in view of the reports in the literature.[8,20] We have, however, noted no unsatisfactory results from this technique in these cases.

Postoperative Complications

Postoperative complications such as unexplained fever, upper respiratory infections, cystitis, ileus, transfusion reactions with urticaria, and minor stitch abscesses were noted in approximately one half of the patients. Of these, unexplained fever was present in 70 per cent, and was usually of low grade. In general, it was felt by the attending physicians to be due to the resorption of blood from the peritoneal cavity. Crawford and Hutchinson[8] have also noted a 55.67 per cent incidence of unexplained fever postoperatively.

Summary and Conclusions

We have presented a series of 219 cases of ectopic pregnancy that have been proven at surgery at Barnes and St. Louis Maternity Hospitals during the ten-year period ending January 1, 1958. A comparison of results was made with some of the reports in the literature. While some of the figures are in the same range as these reports, there are some notable exceptions, for example, the incidence of transmigration of the ovum differs widely from most reports. We have made no attempt to interpret our findings, but merely seek to add them to the growing body of knowledge concerning ectopic pregnancy.

References

1. Davis, J. D., and Malloy, H. R.: J. Nat. M. A., 40:3, 1948.
2. Carrabba, S. R., and Silberblatt, W. B.: Am. J. Obst. & Gynec., 64:1154, 1952.
3. Bates, C. R., and Nabors, G. C.: Southern Med. J., 45:240, 1952.
4. Beacham, W. D., Webster, H. D., and Beacham, D. W.: Am. J. Obst. & Gynec., 72:830, 1956.
5. Anderson, G. W.: Am. J. Obst. & Gynec., 61:312, 1951.
6. Bookrajian, E. N., and Luther, C.: Am. J. Surg., 82:432, 1951.
7. Priddle, H. D., Moulton, C. W., and Dennis, M. S.: Am. J. Obst. & Gynec., 64:1093, 1952.
8. Crawford, E., and Hutchinson, H.: Am. J. Obst. & Gynec., 67:568, 1954.
9. MacFarlane, K. T., and Sparling, D. W.: Am. J. Obst. & Gynec., 52:343, 1946.
10. Beacham, W. D., Collins, C. G., Beacham, D. W., and Griffon, J. T.: J. Missouri M. A., 48:629, 1951.
11. Marchetti, A. A., Kuder, K., and Kuder, A.: Am. J. Obst. & Gynec., 52:544, 1946.
12. Ware, H. H., and Winn, W. C.: South. M. J., 39:44, 1946.
13. Masters, W. H.: J. Missouri M. A., p. 405 (June) 1949.
14. Douglas, G. F., Douglas, G. C., and Douglas, G. F., Jr.: Internat. Coll. Surg., 15:28, 1951.
15. Draa, C. C., and Baum, H. C.: Am. J. Obst. & Gynec., 61:300, 1951.
16. Farell, D. M., and Scheffey, L. C.: Am. J. Obst. & Gynec., 46:686, 1943.
17. Miller, H. E.: Am. J. Surg., 48:47, 1940.
18. Collins, C. G., Beacham, W. D., and Beacham, D. W.: Am. J. Obst. & Gynec., 57:1144, 1959.
19. Langman, L., and Goldblatt, M.: Surg., Gynec. & Obst., 69:65, 1939.
20. Collins, C. G., Beacham, W. D., Beacham, D. W., Griffon, J. T., and Nix, F. T.: Chicago M. S. Bull., 54:357, 1951.
21. Campbell, R. N.: Am. J. Obst. & Gynec., 63:54, 1952.
22. Falls, F. H.: Surg. Clin. North Amer., p. 207 (Feb.) 1950.

Varieties of Tuberculosis in Children

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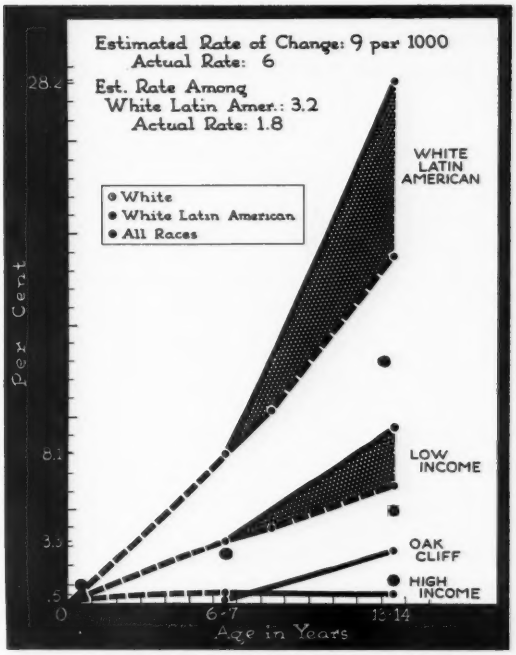


Fig. 1. Tuberculin skin-testing program in selected areas in the city of Dallas. Tests in 1956, 1957, and 1958 at age of six to seven, and thirteen to fourteen. Shaded areas represent differences between projected rates of infection in 1956, and rates of infection actually found in 1957 and 1958. Large black dots represent actual infections in thirteen to fourteen-year-old children in 1958.

Isoniazid has produced significant alterations in the course of tuberculosis in children.

TUBERCULOSIS is a pathological term that signifies the formation of a certain type of tissue reaction. This reaction is common to many agents, some living, some non-living. Tuberculosis as used in the present discussion refers only to the tissue changes that result from infection with M. tuberculosis, and chiefly from the variety hominis. Closely related mycobacteria, the "anonymous" strains as grouped by Runyon, however, produce lesions and disease in most respects hardly differ-

entiable from tuberculosis and sometimes even so designated.

The varieties of tuberculosis as they occur in infants and children are fairly classic in their manifestations. The first consists of a primary pulmonary lesion, almost always very quickly associated with extension to the draining lymph node of the bronchial group. The second phase of the disease is associated with the development of allergy, the necrosis of tissue and the secondary effects that result from such necrosis. Among these may be mentioned cavitation of the original pulmonary lesion and rupture of lymph nodes into adjacent bronchi or vessels. The third variety commonly encountered is hematogenous dissemination, either in the form of occasional mycotic emboli with resultant distant but localized disease, or in the form of an acute bacteremia known as miliary tuberculosis. The fourth variety consists of ordinary tuberculosis of the lung manifesting itself in essentially the same forms as may be found among adults. Finally, a fifth variety, if one accepts the designation, is that form of tuberculosis produced by the anonymous mycobacteria.

TABLE I

Race	Total Population	Hospitalized Children
White	80%	25%
Negro	16%	50%
Latin-American	4%	25%

The background for this sequence of events and this classification has been discussed elsewhere and the pathogenesis of these successive manifestations elaborated upon.[1,2]

The present discussion is drawn from an experience of somewhat more than ten years and hospitalization and personal study of over 200 infants and children. The youngest was six weeks of age and the oldest twelve years (children above that age were managed in other hospitals). Table I indicates the population from which these children were drawn, the figures being given in percentages rather than absolute numbers. Only children who are clinically ill are admitted to the hospital, unless x-ray films or other examinations indicate extensive disease. Most admissions are under the age of three years and from 35 to 50 per cent have evidence of hematogenous disease.

In the usual term of incidence, hospitalization has been calculated to be about 40/10,000 Latin-Americans below the age of twelve years, 3/10,000 Negroes and 1/10,000 whites. These figures, however, refer to the estimated total number of all children. A much more significant figure can be derived from calculating incidence of hospitalization against the number of positive reactors.

Such figures for a time were unavailable, but during the past three years under the auspices of the Dallas Pediatric Society and the Dallas Tuberculosis Association, a method of spot-checking was worked out that allows a fairly reliable estimate of the number of reactors in each of the three groups. For purposes of the test, primary public schools were chosen in the areas of the city in which were the largest numbers of registered cases of tuberculosis, and all first-graders for whom consent could be obtained were tested with Old Tuberculin 1-1000. The results indicate that at the age of six years in areas chosen for "worst" economic and social environment, 2 per cent of white children, 2 per cent of Negro and 8 per cent of Latin-American children reacted to the test dose (Fig. 1). Information from each of the schools tested resulted in approximately the same figures. On the other hand, a school selected for a middle social position resulted in 1 per cent reactors and another chosen for unusually high economic and social environment resulted in 0.5 per cent positive reactors. (In these two schools all students were Caucasians.) If admissions to the hospital are calculated against the estimated number of reactors within the first six years of life, the incidence figures become 1/40 for Latin-Americans, 1/20 for Negroes and 1/100 for whites. Seemingly, the Latin-American or Negro child is not only more frequently infected in early life but also has a higher rate of serious illness. The reasons for these social and economic and racial differences are under study at the present time.

In the entire series, but few children could be classified under the first heading alone, that is, with a simple parenchymal component. Perhaps this is the result of inability to recognize a parenchymal component alone since the x-ray film might well be simply that of a small pneumonic area, and since the disease is essentially without clinical manifestation until allergy and necrosis begin.

By far the commonest admission has been for the second category, the child in whom not only the first draining node, but oftentimes the entire mediastinal group have become greatly enlarged (Fig. 2). In a few such cases, the parenchyma of the lung has been clear, and prolonged follow-up has failed to reveal so much as a fleck of calcium to indicate the site of the pulmonary invasion, though the hilar and mediastinal nodes meanwhile have become heavily calcific. The majority of children become symptomatic at this time and are brought in with complaints suggestive of mediastinal mass and of interruption in air-flow through trachea or bronchi. The films have then revealed segments of lobes completely airless and much contracted, associated with a mediastinal mass. In such children, bronchoscopy, which is a frequent procedure in this service, has revealed either marked distortion and external occlusion of the bronchi or localized and apparently specific bronchitis or both.[3] A few such segments when subsequently resected have presented no pathological evidence of tuberculosis but only the results of bronchial obstruction and secondary pyogenic disease with atelectasis, emphysema, bronchiectasis and fibrosis. The greater part of the parenchymal infiltration in such cases would appear to be non-specific, suppurative inflammation.

The treatment of such a condition in which greatly swollen nodes produce external compression of bronchi has been by and large unsatisfactory from the standpoint of the preservation of the damaged segments, however well the further extension of tuberculosis may be controlled. Bronchograms have revealed residual saccular bronchiectases in a number of cases though the gross shadow of obstructed lung has cleared. The significance of this observation lies in the fact that chemotherapeutic agents for tuberculosis, while they check the multiplication of tubercle organisms, cannot and do not rapidly reduce the size of inflammatory masses such as matted mediastinal nodes.[4]

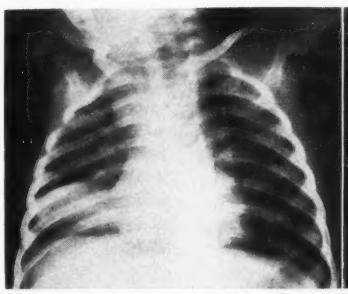


Fig. 2. Characteristic obstruction of bronchus associated with tracheo-bronchial lymphadenopathy in an eighteen-months-old child. (March 7, 1951)

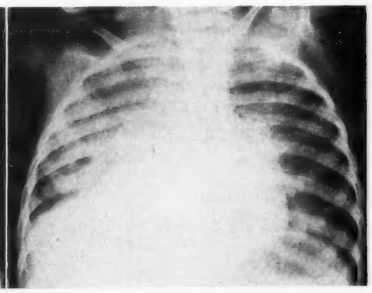


Fig. 3. Complicated primary tuberculosis in a young child. Right lower and middle lobes are obstructed, all mediastinal nodes are enlarged and there is wide-spread dissemination superimposed. (October 22, 1951)

In a number of instances, the infection has spread upward from the right paratracheal nodes to involve the anterior deep cervical group so that masses appear at the base of the neck and, of course, undergo the progressive changes characteristic of tuberculous nodes. It is necessary to make some particular mention of this mode of node-by-node extension to distinguish it from other modes of lymph node infection with the human organism.

Hard upon these manifestations the hematogenous phase develops (Fig. 3). While this experience would hardly support Wallgren's classic time-table for the various manifestations, as a generalization it is probably reliable with respect to the order if not the exact time of appearance. In some twenty cases of tuberculosis of bone, the osseous lesion has not usually developed during the phase of the massive mediastinal involvement. On the contrary, meningitis and pleural effusion have appeared during the presence of mediastinal nodes in over half of these cases. Miliary tuberculosis has also supervened at this time and in the very young infant may develop without the intermediate phase of recognizable lymphatic disease. The youngest such case was eight weeks

old at the time of her admission with miliary lesions. Whether or not pleural effusion should be regarded as a manifestation of hematogenous disease is open to some question. The prerequisite

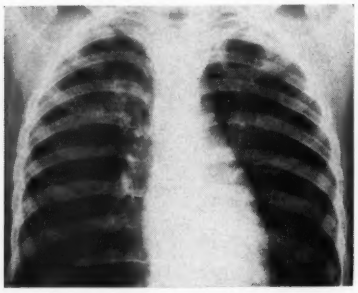


Fig. 4. Usual variety of pulmonary tuberculosis encountered in nine-year-old Latin-American girl. (August 4, 1952)

for its appearance is a subpleural tubercle, a structure which may result either from peripheral spread from a caseating primary site or from hematogenous seeding. In only about a third of the cases of meningitis or pleural effusion has the child been as much as five years of age or had evidence of having healed a primary lesion.

On the contrary, the few instances (about twelve out of 200) of ordinary pulmonary infection encountered have without exception been in children above six years of age and none has been Caucasian (Fig. 4). All have been girls, and the average age is about nine years.

Results of treatment since the advent of isoniazid in 1952, have been outstanding. In the nineteenth century, European writers regularly reported death rates of 25 to 50 per cent in pediatric patients with recognizable tuberculosis. During the period of streptomycin-PAS alone, the writer observed two cases of meningitis to develop in children in the hospital under daily treatment. Meningitis treated with these two drugs resulted in 30 to 40 per cent mortality. Since isoniazid became available, no patient from a much larger group has developed meningitis while under treatment, the mortality from all forms of tuberculosis has been 5 per cent, and a portion of these have resulted from chronic convulsive states long after meningitis as an active process had healed. Miliary tuberculosis has resulted in a single death, that within two days of admission.

Perhaps in osseous tuberculosis the results of isoniazid therapy have been most striking. Reference to old records makes it evident that many younger patients with Pott's disease died either of meningitis or miliary disease. No case of osseous tuberculosis has died. Three cases of Pott's disease, which accounts for half of osseous tuberculosis, have healed without requiring fusions (Fig. 5). Three cases of tuberculosis involving the knee have undergone complete healing with full restoration of the motion of that important joint. It has been possible to drain freely any collection of pus that has been encountered and no persistent sinuses have resulted, nor has any sinus, however deep or chronic, failed to heal.

A review of varieties of tuberculosis in children can hardly be complete without some reference to the disease produced by the anonymous mycobacteria. The disease produced by these organisms in the present writer's view preferably should be called mycobacteriosis, and further classified according to the groups established by Runyon's careful study of hundreds of strains. Of the four groups, Group IV, distinguished by very rapid (two to three days) growth, has so far not been shown to be pathogenic. The other three groups, which are distinguished according to their ability to produce color, have shown definite evidence of varying degrees of pathogenicity and an apparent geographic distribution.

Group I, the photochromogen, which is colorless when incubated in the dark produces a yellow color when a young colony is exposed to light. Strains of this group have been reported most frequently from the central and south central portions of this country. Group II, the scotochromogens, produce orange colored colonies when grown in the dark and only become a little more pigmented when exposed to light. These organisms, less pathogenic than Group I, may also be both less homogenous as to strain and more widely distributed geographically. Group III, the non-chromogen strains, fail to produce color under any conditions. This group may also contain a variety of strains of varying pathogenicity. Most of these organisms reported and identified have come from the Southeastern part of the United States.

The pathological lesion produced by the anonymous strains is not readily differentiable from that produced by the human organism. Some pathologists are of the opinion that lesions tend to be

more liquid and truly suppurative than characteristic lesions of M. tuberculosis.

The drug susceptibility of these organisms is less than that of M. tuberculosis. Group I organisms more closely approach the susceptibility of human strains, but fresh isolates may manifest partial resistance to isoniazid though usually none to streptomycin. Group II and Group III organisms are more variable and usually manifest a higher grade of resistance to the usual antituberculosis agents.



Fig. 5. *(left)* Lateral view of lumbar spine September, 1952, after drainage of large cold abscess. *(right)* Same August, 1954, after two years of therapy with INH-PAS, comparatively little use of supports in the interval.

In spite of these facts, all cases mentioned have been treated with isoniazid and PAS in usual dosages and there have been no relapses or recurrences. It should be mentioned, however, that local excision of nodes has been routine and that the regimen of drugs has been continued for eighteen months.

While these organisms were first observed to produce a tuberculosis-like disease of the lung in adults (somewhat questionable in regard to Group II) the early papers of Weed et al[5] and of Prissick and Masson[6] indicated that organisms other than M. tuberculosis, hominis, caused disease in the lymph nodes of children and Prissick and Masson were able to isolate one such organism from an osseous lesion of a child. The organisms reported by these authors were not studied for group identification. Since then six cases of scrofula caused by such organisms were reported from Dallas.[7] Of these, five were caused by Group I organisms and one by Group II. At the time of the report, the speculation was hazarded that since the nodes usually involved were the tonsillar or submandibular nodes, it might be quite likely that the site of invasion was the tonsil or adenoid, with a less probability that invasion might be through the gingiva during inflammation from dentition. Since that time, an opportunity has arisen to perform cultures on tonsil and an adenoid of a child from whose submandibular node a photochromogen had already been recovered. The tonsil and the adenoid each produced a culture of the same organism so that the oropharyngeal site of invasion seems highly probable.

Since the report, organisms have been isolated from the nodes or drainage of six other children. Two of these have had involvement of other nodes, in one an axillary group, in the other inguinal nodes. A puncture wound of the hand was found in one child and one on the foot in the other. In regard to total strains isolated, one of the strains has been a member of Group II, one of Group III and eight of Group I. (It should

be noted that in the Dallas area, approximately the same ratio of groups to each other has been found in pulmonary disease of adults, while skin-tests with appropriate antigens have also indicated a marked preponderance of reactions to Group I strains.)

In addition to the nodes, one boy with a cyst-like lesion of the distal end of the femur gradually developed a swollen knee. Aspiration revealed pus that contained organisms of Group III morphology and gastric washings produced two separate cultures of Group III organisms. On one of the other services, a somewhat older Latin-American boy died of meningitis from which the only organism recovered was a Group III strain.

Two or three other children have had similar submandibular infections, but though the organisms were readily and frequently seen on smear, cultures failed to result in growth, so that these remain open to doubt.

It is readily appreciated that if such organisms result in disease of bone, joint and meninges, there should be at some time a pulmonary lesion that could be identified as a result of these mycobacteria. None has been reported to the writer's knowledge. There are three cases among recent admissions who may represent such a possibility. One of these children, an older Negro girl, had a severe attack of bronchitis with what was thought to be a very small, lobular pneumonia. Three sputums sent up from clinic were each positive for acid-fast organisms, but culture of all three failed to produce a growth. The child's cough and fever persisted in spite of ordinary antibiotics but diminished rapidly when she was given PAS-isoniazid. The second patient was referred from a suburban town, where her physician, an excellent pediatrician, had found her to have a persistent upper lobe pneumonia that failed to respond to antibiotics. Two sputum smears were made in his laboratory and review by a technician highly trained in the field of mycobacteriology led to a strong suspicion that these were Group I organisms. Culture again failed, but the child recovered rapidly after she was given PAS-isoniazid. The third case, that of an older white girl, was much like the second, except that almost the entire left lung was involved.* Pleural fluid and bronchoscopic aspiration again produced smears containing acid-fast organisms somewhat atypical in morphology. Once again, all types of antibiotics having failed to affect her course, she was given PAS-isoniazid and her pneumonia resolved in about two months.

It should be added that most of these children have reacted in varying degree to tuberculin, though sometimes only to 1 to 100. Their families have been entirely negative so far as chest films are concerned and siblings have had negative tuberculins.

*Since the preparation of this report, a fourth child with pneumonia and pleural effusion has been encountered. The organism cultured from the pleural fluid of this patient was a photochromogen. The clear proof of the etiology of this patient's disease lends support to the suspicion mentioned above.

Summary

1. Tuberculosis in children manifests itself in several varieties, the most common of which is lymph node disease of the tracheobronchial and mediastinal lymph nodes.

2. Often associated with and deriving from this variety is hematogenous disease either of the mycotic embolic or bacteremic type with tuberculous meningitis as its most dangerous manifestation.

3. Isoniazid has produced a significant change in the course of tuberculosis in children.

4. In certain areas infections caused by anonymous mycobacteria may result in confusion, particularly in relation to scrofula, much less frequently in relation to osseous, meningeal or pulmonary disease.

Bibliography

1. Chapman, John S.: Tuberculosis in infants and children. Am. Rev. Tuberc. & Pul. Dis., 73:422-433 (March) 1956.
2. Chapman, John S.: Basic concepts in regard to tuberculosis in infancy and early life. Dallas M.J. 41: (July) 1955.
3. Lincoln, E., Harris, L. C., Bovornkitti, S., and Carretero, R. W.: Endobronchial tuberculosis in children; A study of 156 patients. Am. Rev. Tuberc., 77:39 (Jan.) 1958.
4. Debre, R.: Systematic treatment of primary tuberculosis. Am. Rev. Tuberc., 74:2, 246 (supplement) (Aug.) 1956.
5. Weed, L. A., Keith, H. M., and Needham, G. M.: Non-tuberculous cervical adenitis in children. Proc. Staff Meet., Mayo Clin., 31:259, 1956.
6. Prissick, F. H., and Masson, A. M.: Cervical lymphadenitis in children caused by chromogenic Mycobacteria. Canad. M.A.J., 75:798, 1956.
7. Chapman, John S., and Guy, L. Ruth: Scrofula caused by atypical mycobacteria. Pediatrics, 23:323 (Feb.) 1959.

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X-Ray Hazards and Common Sense

This concise article is full of common sense regarding x-ray radiation. The attention of all physicians should be drawn to the magnitude of this problem. It is our responsibility to our patients that we protect them against excessive radiation. Protective measures and devices are described in this article.

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Presented at the annual meeting of the Southern Minnesota Medical Association, Rochester, Minnesota, September 14, 1959.

"I WILL NOT have my chest x-rayed! I read in the paper that x-rays can produce deformed offspring." This statement by a sixty-three-year-old woman, was actually made when she was urged to have a chest radiograph for a persistent cough. Unfortunately, such beliefs are fairly commonly held. Truths and half-truths disseminated through the lay press, many times in a sensational manner, are eagerly read and often only half understood. The result, then, in the mind of the lay reader, whose knowledge of heredity may be vague at best, is a real fear and a most difficult one to dispel. It is our duty as medical advisors to study the problem, get the facts, and give these patients our best advice.

In order to have a proper understanding of the dilemma facing these patients, let us approach the

situation with a questioning attitude and an open mind. Let us start by asking, is there a real hazard? If so, what is the magnitude? How may a person's health be affected? What may be the effects on coming generations? And finally, how may we minimize the dangers? With answers to these questions, we shall be in a position to give our patients better advice.

I feel particularly fortunate in being able to address this group since this, for the most part, is a meeting of generalists. Most of you, no doubt, have your own x-ray equipment; some of you may be doing fluoroscopic examinations; a few of you are using radium. If you are using any of the above, you are getting some radiation. The tissue effects from any type of radiation are produced by ionization, and to measure these effects it is necessary to have a unit of radiation exposure. This is actually a measure of the ionization produced in a standard volume of air. This unit was devised more than twenty years ago and is known as the roentgen or, abbreviated, by the symbol r. For most purposes in measuring radiation hazards, the unit milli-roentgen or 1/1000 roentgen is used, abbreviated mr. These amounts of ionizing rays can be readily detected and measured right in your office. Certain maximum permissible exposures have been postulated, expressed in the above units.

In attempting to answer the question, is there a real hazard?, it must be determined what harm x-rays do to the body, what hereditary changes may be expected, and whether safe limits of exposure are being exceeded.

The local effects of heavy x-ray exposure are well known; they became evident soon after discovery of x-rays. The pioneers in this field worked with unshielded tubes, producing x-rays of low penetrating power, requiring long exposures. It was not uncommon for both the operator and the patient to develop erythema in areas of skin exposed during diagnostic procedures. After many years, some of these operators developed permanent skin changes such as chronic painful ulcers and skin atrophy. Modern equipment presents few of these problems. Tubes are shielded by a lead envelope, the soft rays can be filtered out, the x-ray beam is of good penetrating quality produced by high voltage. The beam can be coned down to cover only the area of interest and the operator is protected by a leaded wall. Exposures are measured in most instances in fractions of a second. Local reactions are now seen only after therapeutic exposures when they are deliberately achieved.

The general effects of body irradiation are more obscure but have been undergoing intensive study. The changes are often so gradual as to avoid detection. Studies of the life span of individuals exposed to chronic whole body irradiation are not conclusive. The effects on the life span of experimental animals, however, are well established. By assuming that there is a comparable effect on the human body, calculations have been made attempting to relate the experimental results to longevity in man.[1] Values determined by the above means vary greatly. Figures range from a shortening of life by fifteen days per roentgen to one day per r of chronic body exposure.

How does x-radiation work to reduce the life span? Again it must be admitted that the exact mechanism is unknown and assumptions must be made. One of the most reasonable assumptions relates the deleterious effects to somatic mutation. Vast experimental evidence has been accumulated showing the potent effect of x-rays in producing mutations in germ cells. The chromosomes are the vulnerable structures. They are composed chemically of desoxyribose nucleic acid which has a fascinating molecular structure.[2] The molecules are known to be giant sized. Each chromosome consists of thousands of these molecules. The internal structure of this DNA molecule is capable of some variability and this variability offers an explanation of the coding of information for enzymatic control of metabolic processes. DNA resides in the chromosomes of all body cells—somatic as well as reproductive, it is the hereditary material. Changes in this hereditary material will be handed down through mitosis to each succeeding generation of descendant cells. Should these cells be in a strategic location, vital body processes might be impaired and life shortened. X-rays are capable of producing molecular changes through their ionizing properties. The most vulnerable and vital part of the cell would be the giant molecules of DNA in the chromosomes. Chronic body radiation then is probably capable of producing somatic mutation. Through this effect the aging process is accelerated, either through cell death, or inability to carry out its normal function.

What are the hereditary effects produced by x-rays? Again we must seek the answer from

animal experiments. Studies on humans exposed to long term radiation have been done but their scope has been too limited to be of great statistical significance. Questionnaires were sent to radiologists and to a control group of non-radiation exposed physicians by Macht and Lawrence.[3] They found a slightly greater number of stillbirths, neonatal deaths and certain congenital abnormalities in radiologists' children than among non-radiologists' children. It is to be borne in mind, however, that this is a study confined to the first generation of offspring of individuals exposed to chronic radiation, and as yet no studies have shown true hereditary defects produced by radiation induced mutation of human germ plasm carried into the second generation. One of the few studies of second generation offspring of radiated mothers is that of Kaplan,[4] who, since 1925, has treated female sterility with small doses of radiation to the pituitary and ovaries. Of 700 cases treated, 308 women have borne 540 living children. Of these children, thirty-five have grown up, married, and in turn have produced forty-three children. No defects were noted in the second generation. Small as were the doses given to these women, they greatly exceeded gonadal doses during diagnostic radiation. In this connection, I should like to mention a case under my personal observation. A diagnosis of Hodgkin's disease was established by pathological examination of a cervical node in a twenty-three-year-old married woman. Intensive radiation therapy was given to the involved node, but the patient subsequently developed metastases in the mediastinal nodes, ribs, pericecal nodes and spleen, all of which were given roentgen radiation. The amount of radiation reaching the right ovarian region was estimated at 1,200 r and to the left at 100 r. The patient responded well to the above treatment and several blood transfusions. During remission of the disease, she became pregnant and delivered a normal male child, who is now three and one-half years old, and as far as can be determined shows no evidence of any congenital abnormality.

The above cases are quoted, not to minimize the genetic dangers of radiation, but to point out that it is impossible to recognize small mutational defects which undoubtedly exist in these offspring. They may be evidenced only through slight changes in longevity, in minor dysfunctions of an organ or groups of cells, or may be completely undetectible by present methods. I am thoroughly convinced that the conclusions of Muller[5] from his works on hereditary damage produced by radiation of fruit flies are valid, that radiation induced mutations are nearly all detrimental, and that radiation produces a considerably greater mutational effect in man than in drosophila.

In order to determine whether a hazard exists, it is necessary to set a dose limit. For individuals working with ionizing radiation, this figure is now .3r/week. It has also been recommended that no one receive a gonadal dose exceeding 10 r, in addition to background, from conception to age thirty. Background radiation is that received from naturally radioactive substances, which are present everywhere, and from outer space in the form of cosmic rays. These are rather low figures and believed to be safe. Are these conservative limits being exceeded? I believe that in the majority of cases radiation is being held down to tolerable limits. There are abuses, however, which constitute hazards. They are well known to radiologists but less familiar to occasional users of x-radiation.

Among the more important abuses of x-rays is the non-indicated x-ray study—allow me to mention a few which I have encountered. First are studies requested by the patient—usually a patient covered by hospitalization insurance with an allowance for x-ray studies. The responsibility for this abuse, however, lies with the physician who acquiesces and orders the studies. Second are unwarranted studies requested by overzealous physicians. In this category may be listed multiple x-ray studies ordered en bloc; for example, stomach, colon, gallbladder and intravenous urogram. Frequently, such studies are ordered before simpler tests such as urinalysis or stool examination; and, I am ashamed to state, sometimes before a physical examination is done. Next example in this group is too frequent follow-up. It is foolish, pointless and hazardous, for instance, to x-ray a duodenal ulcer every two weeks. Further abuse in this connection is ordering x-ray studies before they are indicated, for example, after only a few days of stomach symptoms to rule out ulcer. Lastly, under abuses by over-zealous physicians, and probably most important, is exposure of children to multiple studies without adequate shielding of gonadal regions. Again in the class of non-indicated procedures may be mentioned x-ray studies made at the insistance of relatives. Along

the same line, in cases of litigation, an attorney will sometimes request complete x-ray studies. I do not believe it is within the province of a nurse to order x-ray studies, yet in many instances the doctor has not seen the patient before he is sent to the x-ray department. School nurses particularly seem to pre-empt this privilege.

One possible source of excessive x-radiation to both the patient and the operator is use of fluoroscopy. Frequently, it is done under less than ideal conditions—that is, before complete dark adaptation of the fluoroscopist's eyes has been attained. The use of too large fields radiates a large volume of the patient's body, and in older machines, may even allow the direct x-ray beam to reach the operator, unattenuated by the patient's body or the lead glass screen. Many of the older machines have inadequate lead protection about the tube and are devoid of aluminum filtration. Unless the operator knows for sure, that his machine has this protection he should check the presence and amount of filtration in his machine. It should have at least a 2 mm aluminum filter; 3mm is still better. These older machines also have a short target-table top distance, which increases the amount of radiation to the patient. Use of fluoroscopy to remove foreign bodies and to reduce fractures is extremely hazardous; it can only be condemned. Fluoroscopy in infants and children should be reduced to the absolute minimum. Unless the shutters are constantly kept to the smallest possible opening, large volumes of the body are irradiated, including the critical gonadal and bone marrow regions. Infant fluoroscopy is low in diagnostic yield. Tissue contrasts are poor. Technicians and nurses are required to hold the infants and they too get significant exposures.

Another source of excessive radiation is the portable x-ray machine. Many of the models in use today are limited in penetrating power; that is, in kilovoltage. They require excessively long exposures. Most have no diaphragming device and in many cases the cones are not used. The resulting film is low in diagnostic yield. The operator is seldom adequately protected. For these reasons it is better to move the patient to the x-ray department whenever possible.

Since we now know that x-rays are potentially dangerous both to the operator and to the patient, it behooves us as conscientious practitioners to do all in our power to minimize the dangers. A very practical manual on the *Medical and Dental Use of X-rays With Control of Radiation Hazards* recently came off the press. It was prepared by the American College of Radiology and written by Dr. Richard Chamberlain who addressed Minnesota State Medical Association in May, 1959. I can summarize in no better way than by reiterating the recommendations given in this manual.

Common sense is the best protection against radiation hazards. The benefits to be derived from increased accuracy of diagnosis greatly outweigh the dangers inherent in use of x-rays. Nevertheless, this method should be employed only after due consideration. Weigh the benefits against the risks. Have good and adequate indications for any x-ray procedure you order. Avoid "head-to-toe" examinations. Be especially cognizant of potential dangers to children. Know your x-ray machine, its filtration, the amount of radiation it produces. Use highest kilovoltage and lowest milliamperage applicable to any procedure. Use cones and shutters to keep the field of exposure as small as possible. Use lead rubber to protect the gonadal regions whenever possible.

Remember always that while x-rays are one of medicine's greatest boons they are not without danger. The danger cannot be directly seen. The peril to future generations cannot be disregarded. Responsibility for the health of millions of people yet unborn may be in our hands. It is a real and serious responsibility—guard it well.

Bibliography

1. Failla, and McClement: The shortening of life by chronic whole body radiation. Am. J. Roentgenol., 78:946-953 (Dec.) 1957.
2. Glass, B.: The genetic basis for the limitation of radiation exposure. Am. J. Roentgenol., 78:955-960 (Dec.) 1957.
3. Macht, S. H., and Lawrence, P. S.: National survey of congenital malformations resulting from exposure to roentgen radiation. Am. J. Roentgenol., 73:442-446 (March) 1955.
4. Kaplan, I. I.: The treatment of female sterility with x-ray therapy directed to the pituitary and ovaries. Am. J. Obst. & Gynec., 76:447-453 (Aug.) 1958.
5. Muller, H. J.: Damage to posterity caused by irradiation of the gonads. Am. J. Obst. & Gynec., 76:467-478 (March) 1954.
6. Chamberlain, R. H., and Nelson, R. J.: A practical manual on medical and dental use of x-rays. The American College of Radiology, 1958.

The Organ of Sight

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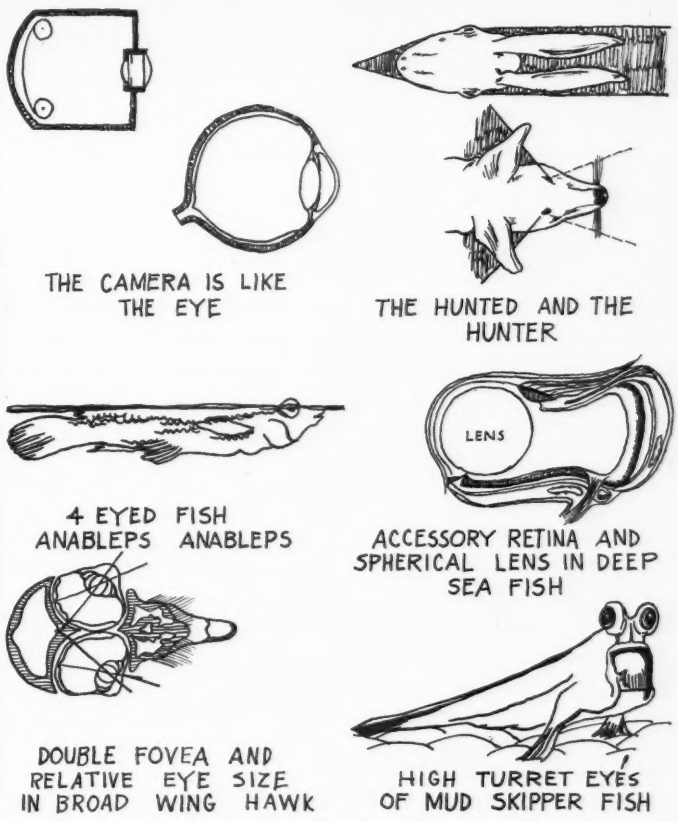


Fig. 1

Adapted from an inaugural thesis given before the Minneapolis Academy of Medicine.

THE SUBJECT of any inaugural thesis always poses a difficult problem to the specialist. He knows that he is to present his material before a group which comprises all of the specialties in the practice of medicine, and is constantly mindful, then, that his audience is a composite general practitioner.

For the sake of broader interest, material has been gleaned from pre-medical and ophthalmological text books and a review of some comparative anatomy pertinent to the eye and its form and function has been assembled.

In gathering ideas and material on this subject, so many ramifications, by-ways, and concepts were brought to the writer's attention that it was soon evident that only a few of the structural eye adaptations which seemed of interest could be presented, hoping to whet physicians' appetites to seek further information from the works of Walls, Detweiler, Prince, Wolfe, Wood, and others. It seems almost unbelievable to learn of the interest, time and tenacity shown by such a man as Casey Wood, whose famous work on the "Fundus Oculi of Birds" covers several hundred ophthalmoscopic examinations of our feathered friends in that one volume alone.

It is common knowledge among students of biology that vertebrate eyes are constructed along a common architectural plan. There are many fascinating deviations to be observed in this structure, but all of the functions—the light collecting, the bending and refracting of the rays, the sen-

sory mechanism in receiving, and the transmitting devices to the higher centers, are found in all vertebrate eyes.

General Structure and Extraocular Muscles

Consider, for a moment, the human eye and review some of its form and function with a few selected clinical applications. In a human, the eye is well protected by its bony orbit. The orbit has seven facial bones all locking together so the eyeball itself is recessed for protection. It is cushioned in its fat as well as in the extraocular muscles and is cradled there in a soft, yet firm, enough position to be protected while remaining mobile. The lids have tremendous musculature so that they can close quickly in the presence of danger. In order to keep the lids from being floppy pieces of skin and muscle, nature has constructed a connective tissue tarsus to give the lids some rigidity and form an attachment for the levator muscle. The two eyes are not only partially supported but are also rotated in a coordinated fashion in their orbits by the extraocular muscles. There are six attached to each eye. It is estimated that the ocular muscles alone are one hundred times more efficient and strong than they need be to rotate the eye. Ophthalmologists become very preoccupied with these muscles not only because the problem of strabisms affords them a good share of their bread and butter, but also because those eyes which respond to glasses, orthoptics, surgery, and similar measures provide a great satisfaction by correcting obvious cosmetic and functional defects.

Wetting Mechanisms

The lacrimal glands which secrete tears, and the ingenious collecting apparatus at the inner corner of the eyes which drains excess moisture down the nasal lacrimal duct into the nose, are useful in man, but the latter is absent in the elephant, fortunately for the veterinarian who might feel the need to perform dacryocystorhinostomy surgery.

The lacrimal gland provides a secretion which is a very good wetting agent, has a tremendous ability to annihilate micro-organisms, and tends to wash away any foreign material coming into contact with the eye. The amount and consistency of its flow is important as are the precipitating factors, whether the normal drip, drip, drip during the day or the increased amount precipitated by a speck of dust or the veritable waterfall that occurs with psychic doldrums.

Very little of the secretion formed during our waking hours ever spills down the cheek unless there is a ptosis or a relaxation of the tone of the periorbital muscles as occasionally seen in the elderly. Nature has even very thoughtfully provided oil glands in the tarsus and its border to increase the surface tension and prevent this spillage just as a housewife might put a little butter around the lip of the syrup pitcher so its contents won't run down the belly of the container and soil the tablecloth.

The Photography Simile

Remember, the eyeball is really composed of the segments of two spheres. The corneal-scleral coat is the tough sturdy outer covering and the first of three. Just inside the sclera is the uveal tract whose name comes from uva, the Greek word for grape which it resembles. Its three portions are the iris, ciliary body, and the choroid. The innermost coat is the retina which, even with its ten layers, is not much thicker than a sheet of cellophane; and the nerve fiber elements stream out the back of the eye to form the optic nerve.

It is an old cliché, of course, to say the eye is like a camera. The two do have a very striking resemblance. Each of them possesses a front and a rear lens. In the eye, the front lens is represented by the cornea and the posterior lens by the crystalline lens itself. Between these two lenses, whether in the eye or camera, a variable aperture is placed to control the amount of light which can enter. Both interiors are lined with black material to absorb light rays and to produce a light-free camera. In the eye, the black melanin pigment cells of the lining cause serious consequences when they go wild and form a malignant melenoma usually seen in the age group over forty. Mother nature can also play a wry trick by eliminating this pigment, resulting in attendant photophobia and blepharospasm which you have all seen in your albinic patients.

The camera is focused by mechanically moving the lenses toward or away from the light-sensitive photographic film. In the eyes, this distance is constant but the thickness of the crystalline lens is altered by the ciliary mechanism through a process we call accomodation. In the camera, the first steps in taking a picture depend upon the decomposition by light of a photosensitive

substance. This is usually silver bromide suspended in a colloidal gelatinous film. The eyes also depend upon decomposition of photosensitive substance in the visual receptors, and a photochemical break-down and resynthesis are constantly going on.

By recalling college physics, one remembers that a one diopter convex lens will bend parallel rays of light and bring them to a focus at one meter. The eyeball is approximately one inch in diameter and because of this short distance it requires roughly a sixty diopter lens system to bring parallel entering rays into a clear focus on the retina. The cornea itself is by far the strongest lens of two and accounts for about seventy-five per cent of the light ray bending necessary for this small camera. The crystalline lens accounts for approximately twenty-five per cent, or fifteen diopters.

The eye needs an even stronger lens system if the person looks at a close object, especially at the third of a meter necessary for reading the evening newspaper. The lens begins to lose its tremendous accommodative powers from the day human beings are born, but it is only when the middle forties come and the lens does not respond glibly and swiftly to the owner's demands for such mundane tasks as removing a sliver from the finger or reading the stock-market reports that it becomes necessary to provide an auxiliary lens in front of the eye. These spectacles may euphemistically be called reading glasses or the patient may submit to bifocals, the Benjamin Franklin invention of lenses split in two with distance vision above and the near glass below. All oculists grin inwardly when a very serious forty-five year old mother tells them that she is sure her youngster is hurting his eyes because he is holding printed material and coloring books so very close to the eyes and is reading and drawing at a four inch distance. This actually mirrors her concern over her own presbyopia which is starting to creep up on her as her near point is creeping away.

All oculists are extremely preoccupied with the crystalline lens, for if through disease, injury, or senescence it should become less transparent, its opacities block the entering light rays. It is inappropriate, here, to list all the misconceptions which are so prevalent in relation to this clinical entity called 'cataract.' To mention only one, a patient with a cataract will probably construe the reluctance of his oculist to perform cataract surgery as the necessary waiting time for it to become "ripe" as it used to be said. This is no longer true. A cataractous lens, any degree, can be removed at any time. The ophthalmologist is actually probably waiting until the other eye fails to the point which he deems necessary before doing a cararact extraction. For even if a cataractous lens is successfully removed and better than 20/20 vision is achieved, if its fellow eye has useful vision, the two eyes can never work as a team to give binocular or stereoscopic vision. This is due to the disparity of the size of their two images. If one of the eyes can still give useful service surgery is often deferred. The laity who misinterpret this hesitancy for surgery put it on a waiting to get "ripe" basis because this is easier to understand than an anisometropic aniseikonia.

The Eye in Other Animals

Let us consider the eye and its structural adaptations in some species other than Homo Sapiens. The animal world is divided into three main activity groups: those which are diurnal, or active in the daytime, those which are nocturnal, and those which are arhythmic, or active at all times and under all conditions. There is also the division between those animals that are primarily hunters, and those that are the hunted. The entire anatomy of the eye and the orbit of the eye is dependent to a certain extent on the animal's activities. If one understands this, one can assume a great deal about an animal's habits and inclinations by a study of its ocular anatomy. For example, many nocturnal animals possess extremely large corneas and huge lenses as if Mother Nature had decided that they should gather every possible illumination. Most animals have round pupils, and the nocturnal animals can get along with circular pupils if they stay out of bright light. However, slit pupils provide a smaller aperture and, as Detweiler says: "Any strongly nocturnal rod-rich animal which cares, or dares, to venture out in the sun—whether a cat stalking a barnyard sparrow, a Gecko seeking flies, a snake seeking warmth, or a shark basking at the surface—needs a slit pupil and will be found to have one."

It is a general rule that eyes which are well forward in the head and are more suitable for

concentration on hunting are accompanied by less prominent snouts. The shape of a rabbit's head and the position of its eyes are fairly typical of a hunted type of an animal. This position gives it a very peripheral type of view. In predatory animals, such as a fox or wolf, the eyes are well forward and concern themselves less with pursuit by other animals.

One of the most interesting eye adaptations is seen in the four-eyed fish called Anableps anableps. This minnow swims on the surface of quiet waters. The eye actually has two pupils, one for air vision and one for water vision. The water line cuts the eye in two. The lens in this eye is pear shaped and the curvatures of the dioptric system used for the submerged pupil are sharper than those employed in the superior or air pupil. Thus both aquatic and aerial views are focused simultaneously upon different regions of the retina. This might be called a genuine bifocal amphibious eye.

Some fishes are constantly submerged except for an occasional leap out of the water. The archer fish, or toxotes, is one that spies its prey outside the water, leaps out and shoots a projectile stream of water at an insect, knocking it down to the surface that it may be devoured. Walls in his book says "If the hydraulic artillery of the Archer fish is dependent upon what he can see from the surface below, he must have a truly remarkable trigonometric range finder in his brain to cope with the ever varying distortion of angles, sizes, and distances."

In some fish the eyes are vertical and in others the eyes are tubular and horizontal. Since their habitat is under water, a markedly spherical lens is maintained. The index of refraction of water and the cornea is approximately the same; thus, the contact of the water against the cornea nullifies the dioptric strength of the cornea, and the intraocular lens from necessity compensates by becoming more spherical and of much stronger dioptric power. In the eye of the Dissoma Anale, a deep sea fish, an accessory retina is found laterally in its vertical eye. This continues up the side and is quite close to the lens. It is felt that the two retinae allow focusing at both distance and near, which can be compared to the bifocals which we find necessary for presbyopia.

A change of the eye position from birth to maturity takes place in some fish. Broadly speaking, it can be said that this movement depends first upon the necessity to achieve survival and then later to perform specific tasks. In the flounder, for instance, there is an eye on each side of the head at birth, but as the flounder matures and turns on its side, the bottom eye migrates through a hole in the skull to assume a position with its fellow eye on the same side, the upward side.

Relative Eye Size

The size of the eye varies tremendously. Amphibians and reptiles have small eyes. Fishes and birds have large eyes. The size of the eye bulbs is relatively constant for members of the same species. There is no constant relationship between the body size and the eye size. Duke Elder points out that eye size seems to be correlated to a greater degree with the nimbleness of the animal's movements and the necessity for sharp vision than with body size. The eye of an antelope, for instance, is larger than that of an elephant. The eagle's eye is larger than man's and some hawks' eyes are equally large. Nocturnal animals and deep sea fishes have characteristically large eyes. A large sized eye holds more advantage for a bird than does an enclosed orbit. Since there is not room for both, nature has increased the strength of the eye by including bone and cartilage in the anterior portion of the hawk's, as well as the owl's sclera, to mention two. Also the eyes in these two examples occupy about one-third the size of the whole head.

In man, the fibrous tunic, or outer layer of cornea and sclera, is made of dense connective tissue. In fish, this layer becomes hyaline cartilage and in some of the reptiles and birds, the cartilage or scleral ossicles are all continuous around the eye to give it support. On the coast of Asia, West Africa and Polynesia, is seen an interesting fish called the mud skipper or Periophthalmus. Its eyes are built in high turrets and swival around as if on universal joints. The eye actually revolves under a secondary covering which protects the cornea from drying out when exposed to air.

Protective Membrane

The nictitating membrane is found in some birds and amphibians; it is a "third eyelid" and is derived from the conjunctiva. Ovio states that this membrane is less developed as the animal's paw is more able to wipe the eye. All that re-

(Turn to page 1791)

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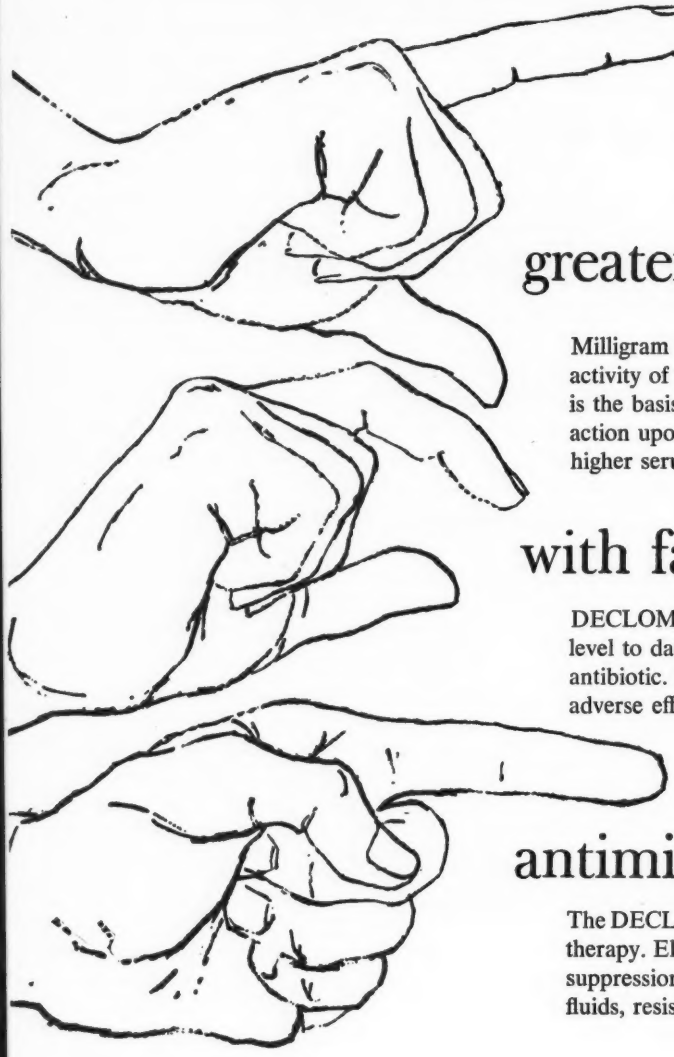
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*Thompson, R. E., and Hecht, R. A.: Am. J. Clin. Nutrition 7:311-317 (May-June) 1959.

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ARMOUR

(Continued from page 1786)

mains in man is the semi-lunar fold of the eye. In birds and some amphibians the nictitating membrane as it is stretched over the eye becomes more transparent in the center and thus forms a sort of window. The tendon of the nictitating membrane passes behind the eye bulb for a better purchase. Birds seem to use the nictitating membrane to the best advantage because, although difficult to verify, it is thought that they keep their eyes covered with it during flight because dehydration of the cornea would result with the prolonged and rapid passage of air over the eye.

When a group of animals changes a way of life, as for instance to burrow below the ground, a delicate cornea would be subject to all kinds of injuries from the abrasive action of the grit and sand. A most effective defense is the spectacle or "brille" which is a thickened transparent membrane over the cornea. Eyelids are a natural defense but some animals have kept them closed for so long, because of living below ground, that the eyes have degenerated to the point of uselessness. An example of a true burrower is the mole which has an eye, less than two millimeters in diameter, which is considered almost totally blind.

Lens and Aperture

Lenses in all vertebrate eyes have a common origin in that they are derived from the invaginated lens plate from the surface epithelium or ectoderm. As one ascends the evolutionary scale, the lens becomes less spherical and more biconvex. In some animals such as the nocturnal Gecko, or nocturnal lemur, the Galago, the lens is also quite spherical. In this case, the lens is so enormous that it is almost equal to one-third of the vitreous cavity. In the human it is about one-ninth the size of the vitreous cavity.

The aperture, or pupil opening, in the front of the eyes varies greatly with different species. So great is the individual variation of the structure and configuration of the iris in humans, that it was long ago suggested by Bertillon, the criminologist, that it be used as a basis for criminal identification. Recently the theory has been revived. Among the more imaginative obstetricians, literature has been published which attributes to the knowing practitioner an ability to predict the sex of an unborn child by a biomicroscopic examination of the pregnant mother's irises. This work, to my knowledge, has never been confirmed.

The ability to make a pin point aperture provides a great capacity to form sharp images at great distances by the phenomenal pin hole principle. I know of only one animal which has a lensless eye and a pin hole camera type vision. This is the nautilus, a spiral-shelled mollusk. This eye has the advantage of being in focus at varying distances from the object being viewed. This principle can be put to use by any of one's myopic friends who accidently drop their glasses on the bathroom floor. One can take a conventional calling card and cut it to fit the spectacle frame. Punch multiple pin holes in the card and the patient will be able to get around with it until a new lens is made.

The Light-Sensitive Retina

There is probably no other portion of the vertebrate eye that has undergone as many changes and adaptations as has the retina. The foregoing describes how the pupil controls the amount of light in the eye. There is another mechanism that exists for adjusting the eye to changing illumination.

Over a hundred years ago, the discovery was made that in the retina there are two main types of visual photoreceptors or cells. These are called rods and cones, each serving a different function of vision. The rods are so-called because of their form and are primarily concerned with colorless vision at low intensity of light and are so situated in the retina that they subserve moving and peripheral, or tail of the eye vision. This is called scotopic vision. On the other hand, the cones are concerned with color, form, and vision at an increased intensity of light. This is called photoptic vision. This concept is called the duplicity theory of von Kries. In the human eye, there are approximately seven million cones and more than one hundred million rods. The rod-cone ratio varies when you pass from the center of the retina in the macular area where there are primarily cones to the periphery where the cones are quite sparse or absent and the rods predominate.

In some animals, photochemical change occurs in the retina so that in bright light the cones contract and the rods elongate. At the same time, the epithelial pigment migrates down over the rods' outer segments to shield them, as it were, from a strong light. With the cones thus being

made accessible to the strong light present, this is the best possible condition for vision. The reverse is true in dim light or nocturnal vision. Here the cones elongate and the rods contract and the pigment contracts back towards the body of the cell. In this diminished light, the rods have become available for the weak light and the cones have moved out of the way. In man, the rods and the cones do not contract, but he does have migration of pigment called dark adaptation of the retina.

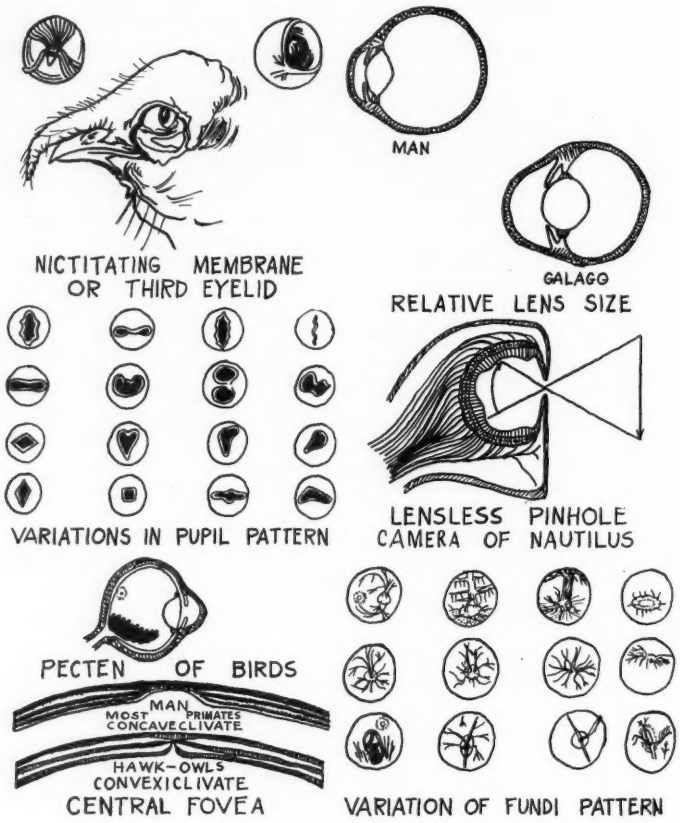


Fig. 2

Some Variable Structures in the Fundi

An ophthalmoscopic view of the fundus can vary tremendously from species to species. Great variations can be found not only in the position and shape of the disc but also in the disposition of nerve fibers in the vessels and fundus. In a bird's eye for instance, you will always find a pecten. This is a pleated triangular membrane that extends into the vitreous chamber usually near the optic disc. It is richly supplied by blood vessels and is folded and convoluted as it extends forward from the nerve head. It is completely covered with pigment which gives it a velvety appearance. Many theories have been expounded on its use. One is that it helps the bird in its celestial navigation; another is that it helps nourish the eye because of the cone-rich retina; another, that it is a protection of the eye against intense light because the rich blood supply can help carry away the heat of the sun at high altitudes.

Several devices noted above have been used in the animal world, to improve vision at night. One which has not been mentioned is called the "tapetum." This is a layer of reflecting tissue of metallic crystals behind the retina. This produces "eye

shine," the reflection seen coming from the eyes of animals when the headlights of an automobile flash on them. The reflecting tapetum is never seen inferiorly to the horizontal equator of the eye. If it were present below, it would catch all of the glare from the sky and would cause a dazzle in the animal's vision. The tapetum is usually responsible for the color of the animal's eyes. Red color in the fundus is seen in primates, including man, and the color comes from the blood in the choroid modified by the density of the pigment of the epithelium. A yellow color is usually seen in cats, elephants, and squirrels. There is an enormous variation in the ophthalmoscopic patterns, and if one really wishes to be startled, he should take an ophthalmoscope and look into the fundus of a horse.

The Point of Focus

And finally we shall discuss, for a moment, the fovea. In photography, a fine-grained emulsion film takes a much sharper picture than a coarse-grained emulsion. Such a situation is felt to exist in the fovea. In the macular areas, there is a great variation in the concentration of the number of cones in any given space. One researcher felt there were approximately one million cones per square millimeter at the fovea of the hawk, Buteo, compared with man's fovea which is estimated to have about one hundred and sixty thousand per square millimeter. This disparity alone would convince one that a hawk's vision is much sharper than man's. It is felt by conservative researchers that the resolving power of visual acuity in some hawks and eagles is approximately eight times that of humans. The depression, or thinning of the retina at the foveal area has usually been thought to be constructed so that light may have unimpeded access to the visual cells without passing through the various layers of the retina as it does elsewhere. In this connection, Walls, in 1942, offered a very stimulating theory based on the difference in refractive indices of the vitreous and retina. Walls felt that when light struck the foveal clivus, or depression, it was refracted and broadened its image by bringing into play a larger number of visual cells than would otherwise be utilized. The convexiclivate fovea is seen in those creatures which we readily admit have vision that is far superior to our own. In man's concaveclivate fovea, because of its broader base, the refractive index of the clivus is not so great. Some animals have two foveas. In birds, there is often a foviate band which is called a strip fovea. This sometimes joins the temporal and central foveas and is usually found in the more predatory birds and the faster flyers.

Conclusion

This presentation is concerned with only a part of the structural adaptations of the eye. It is self-evident that in the general scheme of evolutionary ascendency, the human eye does not represent the acme of efficiency as far as an organ of sight is concerned. One notes that birds are equipped with a much more efficient focusing apparatus and a more complex macula subserving higher visual acuity than is man. However, *Homo sapiens* can draw himself up with customary superiority and loudly declare that these other animals do not possess his Betz cells and cortical connections which provide such reasoned visual judgments and interpretations, and that with this superiority of the visual brain cortex over animals, one can help keep and hold the intellectual supremacy of man.

Acknowledgment

The illustrations used in this article are adapted from Walls, Detweiler, Prince, Wolff, and others.

Bibliography

Berliner, M. L.: Biomicroscopy of the Eye. Vol. 2, New York: Hoeber, 1959.

Detweiler, S. R.: The eye and its structural adaptations. Am. Scientist, Vol. 55 (Jan.) 1956.

Detweiler, S. R.: Vertebrate photoreceptors. Exper. Biol. Monographs, 1943.

Duke-Elder, S.: Textbook of Ophthalmology. London: Kimpton, 1932-40.

Linkz, Arthur: Physiology of the Eye. New York: Grune & Stratton, 1950.

Polyak, S. L.: The Retina. Chicago: University of Chicago Press, 1941.

Prince, J. H.: Comparative Anatomy of the Eye. Springfield: Chas. C Thomas, 1957.

Walls, Gordon L.: The Vertebrate Eye. Cranbrook Institute of Science, 1942.

Wolff, Eugene: The Anatomy of the Eye and Orbit. London: Lewis, 1948.

Woods, Casey Albert: The Fundus Oculi of Birds. Chicago: Lakeside Press, 1917.

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Endometriosis of the Sciatic Nerve Without Evidence of Pelvic Endometriosis

Report of a Case

Read at the meeting of the Southern Minnesota Medical Association, Rochester, Minnesota, September 14, 1959.

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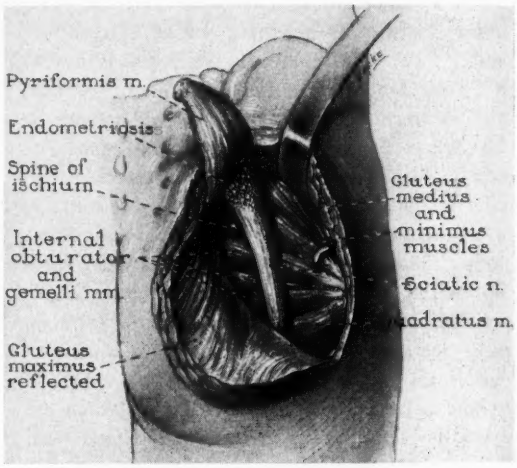


Fig. 1. The operative approach and the lesion of the endometrium in the sciatic notch with the piriformis muscle reflected.

● *Cyclical pain occurring anywhere near the pelvis and having the same rhythmicity as menstruation should suggest the possibility of endometriosis. In this case, endometriosis involved the sciatic nerve in the absence of any other evidence of ectopic endometrium. The pain was controlled by establishing an artificial menopause.*

Dr. Granberry is a Fellow in Orthopedic Surgery, Mayo Foundation; Dr. Henderson is from the Section of Orthopedic Surgery; Dr. Miller, Section of Neurologic Surgery; Dr. Faber, Section of Obstetrics and Gynecology; and Dr. Dockerty, Section of Surgical Pathology, Mayo Clinic and Mayo Foundation, Rochester, Minnesota. The Mayo Foundation is a part of the Graduate School of the University of Minnesota.

SINCE the work of Mixter and Barr[1] in 1934 on rupture of the intervertebral disk in the lumbar region as a cause of sciatica, and later papers by Love, Camp[2] and others[3] demonstrating this clinical entity, there has been a growing tendency on the part of physicians to consider rupture or protrusion of an intervertebral disk in the lumbar region as the only cause of sciatic pain. This has occurred in spite of papers by Bankart,[4] Young[5,6] and others emphasizing the other causes of sciatic pain. Among the other causes are spinal arthritis, neoplasms of the soft pelvis and the pelvic bones, infections and other diseases of the sacro-iliac joints, osteoarthritis of the hip, peripheral neuritis, osteoid osteoma or eosinophilic granuloma of the femur or pelvic bones, soft-tissue tumors of the popliteal space, fractures of the vertebrae, and myositis or bursitis in the gluteal region. Tumors of the sciatic nerve itself may produce sciatic pain also.

We wish to report in this paper an unusual case of endometriosis involving the sciatic nerve and producing sciatic pain. The cyclical nature of the pain and the difficulty in establishing a diagnosis were important features of the clinical course. In addition, we wish to present the pathologic features and a theory on the possible pathogenesis of this condition.

Only a few cases of endometriosis associated with sciatic pain have been reported. Caprioglio[7] reported the case of a woman with supposed pelvic endometriosis who had sciatica, but no operative procedures were carried out. Dagnelie[8] reported in detail a case of sciatica of cyclical nature in

which he was able to palpate nodules on the sciatic nerve in the pelvis. His patient was relieved of symptoms by testosterone, but no exploratory operation was carried out. Schlicke[9] reported another case of sciatica in which a painful nodule in the posterior part of the thigh proved to be an endometrioma on biopsy. Ectopic endometrial tissue in the area of the sacrococcygeal junction was reported to be a cause of sciatica by Amaral Ferreira.[10] The many other reports of ectopic endometrial tissue in the literature will not be reviewed in this report.

Denton and Sherrill[11] reported the only case of endometriosis involving the sciatic nerve itself that was proved by biopsy so far as we could determine. Their patient, a forty-eight-year-old white woman, had had recurrent right-sided sciatica for three years; the attacks would begin two to three days prior to her menses and subside two to three days after cessation of menses. Physical findings included hypalgesia in the distribution of the first sacral nerve root with a positive result from the straight-leg raising test and tenderness over the sciatic notch. A myelogram revealed protrusion of the fourth lumbar intervertebral disk on the right side. However, they did not perform laminectomy, but explored the sciatic nerve and found a 2-inch tumor involving the lateral quarter of the nerve just above the greater trochanter. In this case, as in ours, the endometrioma of the sciatic nerve appeared to be a solitary lesion and was not accompanied by other lesions of endometriosis in the pelvis or elsewhere.

Report of Case

A thirty-two-year-old married woman, gravida 4, para 2, first registered at the Mayo Clinic in September 1957, because of low back pain and pain in the posterior portion of the right thigh of two years' duration. The pain typically began two to three days prior to her menses and lasted two to three weeks. There was only a seven- to ten-day pain-free interval between menses. Her gynecologic history was normal. There were no menstrual irregularities, and her general health and a review of systems were noncontributory.

Examination revealed a woman of medium stature who was apparently in good health. Except for moderate hypertension the only other positive physical finding was limitation of motion during the straight-leg raising test on the right side to 45 degrees. Laboratory findings were within normal limits. Roentgenograms of the lumbar vertebrae revealed a transitional lumbosacral segment and four normal lumbar vertebrae. Because the patient had a history of sensitivity to iodides, an air myelogram was made. The results of this were equivocal, although some deformity of the air column at the lumbosacral level on the left seemed likely. A tentative diagnosis of protruded intervertebral disk was made, and the patient was instructed in conservative measures.

She returned in March 1958, reporting much the same history of cyclical pain of increasing severity. Results of the general examination were the same as previously, but neurologic examination revealed definite weakness in the anterior tibial, toe-extensor, and peroneal muscles. The straight-leg raising test on the right showed limitation of motion at 30 degrees. Reflexes were normal. An electromyographic study revealed fibrillation, grade 3, on a grading basis of 1 to 4, in the anterior tibial, toe-extensor and peroneal muscles. This was interpreted as indicative of denervation of the muscles supplied by the fifth lumbar nerve root. Gynecologic examination which had been negative previously was repeated because of the possibility of endometriosis, but no abnormalities were found.

On March 25, 1958, an exploratory hemilaminectomy was carried out at the fourth and fifth lumbar interspaces on the right side. At the fourth lumbar interspace a degenerated protruded disk was found and removed. The surgeon reported that the nerve root appeared to be tightly compressed prior to the removal of the disk and was loose after the disk was removed. A protruded disk lying laterally at the fifth lumbar interspace on the right side was removed also. Because of the congenital anomaly of the lumbar vertebrae, an iliac fusion was carried out extending from the fourth lumbar to the second sacral segment on both sides. Postoperative convalescence was complicated by a staphylococcic pneumonitis which responded promptly to antibiotics.

The patient returned home without being relieved of symptoms. By August 1958, five months after operation, however, she said that she was nearly free of her symptoms, and the fusion was found to be successful.

The patient again returned to the clinic in February 1959, with recurrent pain which was identical to that which she had had prior to operation. The symptoms were somewhat more severe and examination disclosed that the right hip was held in abduction and external rotation. There was obvious atrophy of the hamstring and sural muscles as well as those in the anterior aspect of the leg. She stood with a list to the right side at the lumbosacral junction, and there was spasm of the erector spinae muscles. A high degree of tenderness was found at the sciatic notch.

On February 19, 1959, a diagnostic paravertebral block at the fifth lumbar level on the right side with lidocaine hydrochloride (xylocaine) was performed. This did not relieve her pain, and the procedure was discontinued because of rather severe bleeding. At this time exploration of the sciatic nerve was decided on because of the aggravation of the pain on internal rotation of the hip and the definite tenderness at the sciatic notch.

On March 12, 1959 (Fig. 1), the sciatic nerve was approached through a modified Gibson incision, and at the level of the sciatic notch the nerve was found to be encased and infiltrated by a dense, brown, fibrous process for a distance of about 1.5 inches that extended

into the adjacent surrounding tissue at the sciatic notch. Decompression and neurolysis were carried out, and specimens of the tissue and of the nerve sheath were removed. A small incision into the posterior part of the capsule of the hip revealed no abnormalities of the hip joint itself. The piriformis muscle was sectioned at the time of operation.

Following the operation the patient remained free of pain until the fourth day of her next menstrual period when the pain recurred and was present for approximately ten days. It then began to subside. Examination at that time revealed poor function of the peroneal division of the sciatic nerve. The pathologic report had revealed an endometrioma involving the sciatic nerve, so that the patient was offered irradiation to suppress ovarian function. This was accomplished by roentgen therapy over the pelvis. The patient has had no pain since that time. The motor function of the peroneal division of the sciatic nerve has not recovered to date.

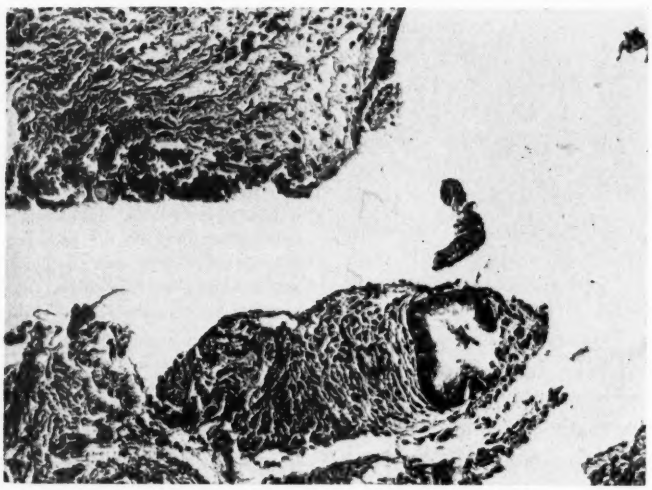


Fig. 2. Endometrioma of the sciatic nerve showing a typical endometrial gland surrounded by spindle and stellate stromal cells (hematoxylin and eosin; x150).

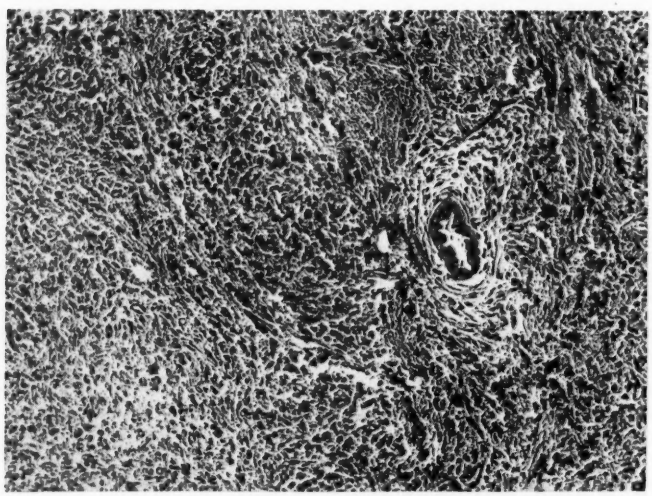


Fig. 3. An endometrial gland with its surrounding stroma appears in a mass of fibrous tissue which is richly impregnated with granules of hemosiderin deposited during ancient and repeated menstrual bleedings (hematoxylin and eosin; x150).

Pathologic Aspects.—The tissue removed at operation consisted of irregular fragments aggregating approximately 3 cm. in diameter. Grossly tough and fibrous, they were streaked here and there with dark-brown and

light-yellow zones of pigmentation. Microscopically, the bulk of the material exhibited fibrous-tissue proliferation with sizable aggregates of lymphocytes which were particularly related to the vicinity of the small blood vessels. Much of the tissue was impregnated with granules of hemosiderin which varied in color from light orange to dark brown in the hematoxylin and eosin preparations. Some of these granules were located within the cytoplasm of phagocytic histiocytes; others appeared to be lying free among reactive connective-tissue cells and the collagen fibers. A certain amount of hyalinization in these zones indicated a prolonged tissue reaction to repeated depositions of the pigment.

Scattered here and there, and illustrated in Figures 2 and 3, were endometrial glands lined by tall cells and surrounded by dark-staining, plump spindle cells which are characteristic of endometrial stroma. The combined picture was that of endometriosis with a tissue reaction from recurrent menstruation with dissection of tissues by menstrual blood and the products of glandular secretion.

Comment

From the previous recital of the facts of this case it is obvious that the diagnosis was difficult to establish, and we were misled by the presence of multiple protruded intervertebral disks and the relief of symptoms of this patient following removal of these disks and the successful fusion of the two lumbar joints. Although endometriosis was suspected as being the cause of this condition throughout our observation of this patient, repeated pelvic examinations failed to reveal any evidence of pelvic endometriosis. Because of this fact, speculation on the possible pathogenesis of ectopic endometrial tissue in the sciatic nerve seemed inevitable. Although the pathogenesis of uterine adenomyoma is related to direct invasion of the uterine wall by the glands and stroma of the adjacent endometrium, such an explanation cannot apply to the situation found in the case we are reporting. Likewise inapplicable is the implantation theory which might explain, by tubal regurgitation of endometrium, the familiar chocolate cysts of the ovaries and the peritoneal seeding of the cul-de-sac. Lymphatic embolization seems unlikely inasmuch as retrograde flow would have to be postulated to explain the carriage of endometrial tissue from the pelvis to the thigh. Metastasis via the blood stream always remains as an unprovable histogenetic possibility but, in our opinion, a remote one since among other things it postulates passage of the endometrial tissue through the lungs.

To us the most logical explanation for the occurrence of endometriosis of the sciatic nerve is metaplasia from the pelvic peritoneal mesoderm. It has been observed, for instance, that endometrial deposits in pelvic lymph nodes are subcapsular rather than more deeply placed. Current opinion accordingly discounts the notion that lymphatic embolism produced them and promotes the notion that they arose from the adjacent peritoneum by a process of metaplasia. By the same token, origin of the lower limb buds from the mesoderm adjacent to the pelvic peritoneum could account for the origin of such endometrial foci therein. The growth of the limbs then could effect the migration of such foci to the sites indicated.

The observed clinical phenomena of periodic pain and swelling relate to the fact that endometrial tissue, wherever located, responds with proliferation, differentiation, decidual reactions and menstruation to the action of ovarian hormones.

In conclusion, we have presented one case of endometrioma of the sciatic nerve without evidence of pelvic endometriosis that produced a picture of sciatic pain of a cyclical nature. The diagnosis was delayed because of the absence of pelvic endometriosis and the finding of multiple protruded intervertebral disks in the lumbar region. The only similar case which we could find in the literature, and one which parallels our case quite well, is one reported by Denton and Sherrill.[11]

References

1. Mixter, W. J., and Barr, J. S.: Rupture of intervertebral disc with involvement of spinal canal. New England J. Med., 211:210-215 (Aug. 2) 1934.
2. Love, J. G., and Camp, J. D.: Root pain resulting from intraspinal protrusion of intervertebral discs: Diagnosis and surgical treatment. J. Bone & Joint Surg., 19:776-804 (July) 1937.
3. Love, J. G., Adson, A. W., and Craig, W. McK.: Chronic recurring sciatic pain due to protruded intervertebral disks. Journal-Lancet, 58:479-481 (Nov.) 1938.
4. Bankart, A. S. B.: Low back pain and sciatica. Practitioner, 157:367-371 (Nov.) 1946.
5. Young, H. H.: Non-neurological lesions simulating protruded intervertebral disk. J.A.M.A., 148:1101-1105 (Mar. 29) 1952.
6. Young, H. H.: Additional lesions simulating protruded intervertebral disc. J. Internat. Coll. Surgeons, 17:831-839 (June) 1952.
7. Caprioglio, Angelo: Sopra due casi di endometriosi. Minerva ginec., 5:532-535, 1953.
8. Dagnelie, Jacques: Contribution a l'étude des endométriomes hétérotopiques. Ann. d'endocrinol., 8:26-31 (June) 1947.
9. Schlicke, C. P.: Ectopic endometrial tissue in the thigh. J.A.M.A., 132:445-446 (Oct. 26) 1946.
10. Amaral Ferreira, C.: Endometrioma da região sacro-coccígea. Ann. Brazil ginec., 33:373-376 (June) 1952.
11. Denton, R. O., and Sherrill, J. D.: Sciatic syndrome due to endometriosis of the sciatic nerve. South. M. J., 48:1027-1030 (Oct.) 1955.

Traumatic Interventricular Septal Defect

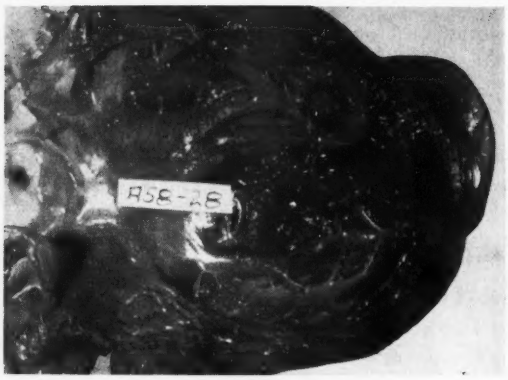


Fig. 1. Septal defect seen from the left ventricular side. The edges of the defect are smooth.

● *Evidence of external trauma to the chest need not be present with serious trauma resultant in the heart. This interesting case report of a healthy young man demonstrates the rare situation of an interventricular septal rupture in an apparently normal heart subsequent to an automobile accident. The availability of surgical procedures to correct such traumatically-induced defects as interventricular septal defects, aneurysms of the ventricular wall, and lacerations of the mural portions of chambers increases the necessity of accurate evaluation and diagnosis of these sequelae.*

WITH increasing automobile travel, the incidence of traumatic injuries is constantly rising and the heart is frequently involved by non-penetrating blows to the chest. In most cases such cardiac injuries consist of contusions or lacerations of the mural portions of the chambers. Interventricular septal damage is uncommon and is usually associated with much more severe damage in other portions of the heart. Cases of septal rupture in hearts normal before the trauma and without other cardiac injuries are rare. However, their recognition is important since surgical techniques have now been developed to correct these defects.

Pollock,[1] in 1952, reviewed the world literature and found twelve cases of isolated septal rupture to which he added another. All of these, and a fourteenth case reported by Cary,[2] were proved by autopsy. Guilfoil[3] recorded the first case established by cardiac catheterization in 1953. Two other cases proved by this means have been reported by Crow and Brogdon.[4] Successful repair of two such defects has been accomplished, one by Varco and Lillehei,[5] and the other by Pierce.[2]

The following case is reported to alert physicians once more to the possibility of cardiac damage when the chest shows no evidence of trauma and to present the pathologic findings in this unusual condition.

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Fig. 2. Defect as visualized in cut surface through the interventricular septum. The linear character of the laceration is evident.

Report of Case

H. R., a twenty-eight-year-old ex-Air Force flight engineer, while driving his automobile late at night, fell asleep and struck a lamp post at a speed estimated to be greater than 50 miles per hour. He had been in good health prior to the accident, and a physical examination less than one year prior to admission indicated no cardiac abnormality.

On admission to the hospital he was in obvious shock, bleeding severely from a laceration of the neck and tongue. The pupils were equal and dilated, reacting to light and accommodation. The chest revealed no evidence of trauma externally, and no rib fractures could be palpated. The lungs were clear to percussion and auscultation. The left heart border could be percussed 9 cm. to the left of the midsternal line; the right border was at the midsternal line. A grade 4 crescendo systolic murmur was heard at the left fourth intercostal space adjacent to the sternum and was quite well localized to an area having a circumference of 10 cm. The murmur was barely audible at the base of the heart, could not be heard at the apex, and did not radiate to the back. No thrill was felt. A2 was reported as louder than P2. The rhythm was regular but over 120 per minute. The abdominal examination was negative. Examination of the extremities revealed fractures of the proximal one-third of the right femur, a compound fracture of the right tibia, a fracture of the right patella, and a bimalleolar fracture of the right ankle. Initial x-ray examinations revealed the lung fields to be clear, the heart of normal size, and no rib fractures. An electrocardiogram revealed a sinus tachycardia with left axis deviation. The PR interval was 0.14 to 0.16 seconds. T was flat in leads 1 and negative in AVR and AVL.

The patient was transfused, taken to the operating room, and the compound fracture of the tibia irrigated and reduced. He was returned to the ward in relatively good condition. However, within twenty-four hours he developed severe respiratory distress due to the accumulation of viscid secretions which necessitated an emergency tracheotomy. At this time his state of consciousness was noted to have changed markedly. He became confused and within five hours markedly somnolent; within ten hours he was comatose. Forty-eight hours after his admission, moist rales were noted diffusely over both lung fields. The cardiac murmur remained unchanged and the heart rate continued to be rapid. The clinical impression at this time was left heart failure and the patient was digitalized rapidly with cedilanid. Within six hours after completion of digitalization the rales cleared, the respiratory rate had dropped to 16 per minute and his state of consciousness improved.

On the third day many small petechiae were noted on the neck and trunk. Somnolence returned and the ventillatory drive was markedly diminished with respirations shallow and irregular. A surface skim of urine revealed many fat droplets. During the next three days the patient showed varying degrees of consciousness. The cardiac findings remained unchanged. The heart size by x-ray also remained unchanged but the lungs showed diffuse congestive changes and the liver enlarged to 5 cm. below the costal margin. Urinalyses, electrolyte balance studies, and hematological tests were maintained at normal values but the serum bilirubin rose to 3.3 mg. per cent. Other liver function studies gave normal values. The patient was maintained on daily injections of intravenous digitoxin. Blood and intravenous fluids were given as needed. Oxygen was administered under pressure on several occasions. By the seventh day the patient was being intermittently assisted with the Bird respirator because of continuing respiratory deficiency felt to be related to central nervous system damage from the fat emboli. There seemed to be gradual improvement during the eighth and ninth days of hospitalization, but

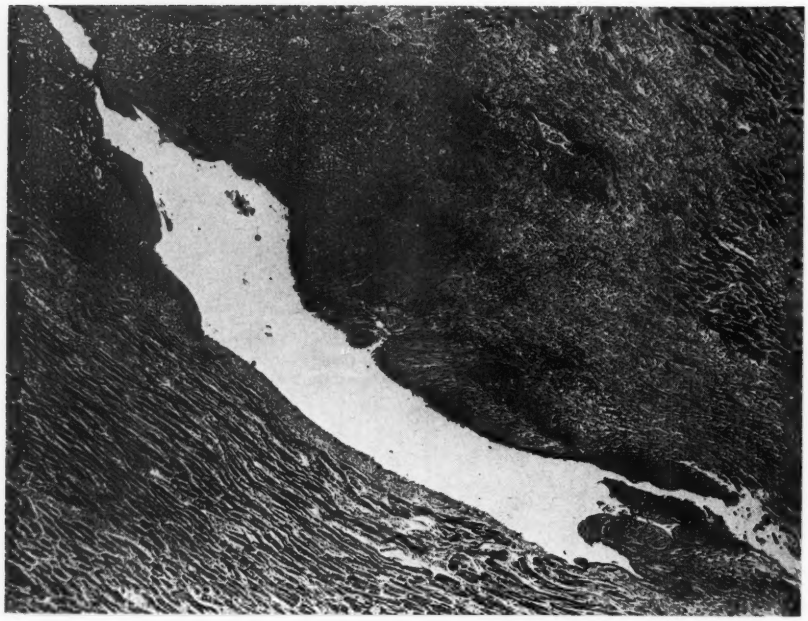


Fig. 3. The defect is parallel to direction of fibers. Portions of attached thrombus are evident (x30).

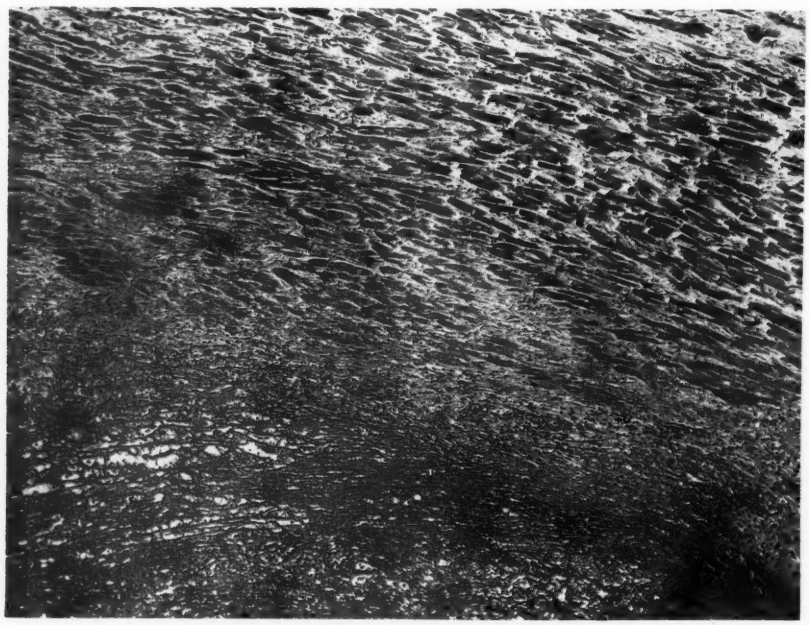


Fig. 4. Beginning organization of the attached thrombus is evident (x90).

on the morning of the tenth day the patient became ashen, a pulsus alternans suddenly developed, and within two minutes he expired.

Autopsy.—The postmortem examination was conducted approximately eleven hours after death. The external examination revealed scattered traumatic injuries of the head, neck, and extremities with a Kirschner wire in the right lower leg. The peritoneal, pleural, and pericardial cavities were free of excess fluid or adhesions. The heart weighed 410 grams. The epicardial surface was smooth and glistening. The ventricles did not appear hypertrophied. On opening the heart, both atria and their appendages were normal. The endocardial surfaces of both right and left ventricles were smooth and glistening. There was no evidence of performation or contusion of the mural surfaces of the ventricles. All valve leaflets were thin and pliable with no traumatic damage to the leaflets or chordae tendineae. The valve ring circumferences were within normal limits. Upon examination of the interventricular septum, a 2.4 cm. linear tear was found perpendicular to the caudocephalic axis of the heart which extended completely through the septum. This lesion was approximately midway between anterior and posterior wall and at the junction of middle and lower third (Figs. 1 and 2). Enmeshed in the rent was antemortem clot, and in one area of the free margin of the rent a thin rim of fibrosis was noted. Both coronary arteries were normal.

The lungs were diffusely nodular with purulent material in the nodules. The spleen weighed 500 gm. and appeared congested. The liver weighed 2300 gm. showing a nutmeg surface on section. The kidneys were swollen bilaterally with a combined weight of 380 gm. and also appeared congested. The brain showed scattered small petechial hemorrhages through the deep white matter, corpus callosum, the brain stem, and the cerebellar peduncles. With the exception of the fractures, the rest of the gross examination was within normal limits.

Microscopic examination of the tissues revealed passive congestion of the liver, spleen, and kidneys. The lungs showed patchy areas of bronchopneumonia. Special stains revealed fat emboli in the glomerular and cerebral capillaries.

In the heart, the interventricular septal defect was noted to be parallel to the direction of the main bundles of muscle fibers. There was antemortem thrombus adherent to the edge of the tear which showed beginning organization (Figs. 3 and 4). Sections away from the defect were entirely normal.

Discussion

At the beginning of isometric contraction, the interventricular pressure rises precipitously while the septum begins rotating about itself in a caudocephalic axis. If at this juncture a blow is sustained, one can postulate that since the tension is greatest in the I-V septum, it is this portion of the musculature which will rupture. One would expect the force to separate rather than fragment the myocytes, and the photomicrographs demonstrate the linear nature of the lesion with the sheer in the axis of the fibers and perpendicular to the caudocephalis axis of the heart. This corresponds with the majority of cases adequately described for comparison which have so far been reported.

Gore[6] has emphasized the need of caution in classifying lesions of the heart as traumatic in origin pointing out that even in young individuals pretraumatic disease may exist in the heart. We feel this case to represent solely a traumatic lesion since the previous history was negative and the pathologic findings, both gross and microscopic, are consistent with a lesion of approximately ten days' duration. The myocardium away from the septal defect shows no evidence of antemortem pathology.

The high incidence of trauma to the heart in automobile accidents has been discussed in many articles but the majority of such cases show injury of the chest wall as well. This case dramatically illustrates the severe traumatic cardiac lesions that can develop in the absence of any evident trauma to the thorax.

Summary

The pathology in a rare case of traumatic interventricular septal defect is presented which illustrates the severe cardiac pathology that may occur with no evidence of thoracic injury.

References

1. Pollock, B. E., Markolz, R. A., and Shuey, H. E.: Isolated traumatic rupture of the interventricular septum due to blunt force. Am. Heart J., 43:273-284, 1952.
2. Cary, F. H., Hurst, J. W., and Arentzen, W. R.: Acquired interventricular septal defect secondary to trauma. New England J. Med., 258:355-359, 1958.
3. Guilfoil, P. H., and Doyle, J. T.: Traumatic cardiac septal defect: Report of case in which diagnosis is established by cardiac catherization. J. Thoracic Surg., 25:510-515, 1953.
4. Crow, N. E., and Brogdon, B. G.: Interventricular septal defect secondary to non-penetrating injury. A.M.A. Arch. Int. Med., 103:790-795, 1959.
5. Campbell, G. S., Vernier, R., Varco, R. L., and Lillehei, C. W.: Traumatic ventricular septal defect. J. Thor. Surg., 37:496-501, 1959.
6. Gore, I.: The question of traumatic heart disease. Ann. Int. Med., 33:865, 1950.

Auto-immunity in Thyroid Diseases

The author reviews the literature on auto-immunity in thyroid disease. He points out that there are two different antigens stimulating antibody formation in thyroid disease and suggests that there may be more. It is possible that spontaneous myxedema may be the end result of auto-immunity and thyroiditis. A correlation between chronic liver disease in women and thyroiditis-like alterations in their thyroids leads the author to suggest that there may be a pathogenic similarity here.

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HORROR AUTOTOXICUS was the term Ehrlich used to describe what he considered a biological law—the inability to produce antibodies against the tissues of one's own body. For many years this concept was immunologic gospel, though reports appeared from time to time raising doubts about its validity. In recent years however evidence has accumulated for the existence of auto-antibodies in certain diseases. A prominent example is auto-immune hemolytic anemia.

The present interest in auto-immunity and thyroid disease stems from two approaches to the search for auto-antibodies in thyroiditis, both developing within the past four years. One reflects the work of Witebsky, Rose and co-workers in Buffalo, who were interested in antibodies to thyroglobulin produced in the rabbit. The other reflects the efforts of Roitt and Doniach to demonstrate that the elevated serum gamma globulins observed in Hashimoto's thyroiditis was due to increased circulating antibodies to thyroglobulin.

Long before these two groups sparked the present surge of interest in thyroid antibodies, a flicker or two of light on the subject was seen, but not pursued.

As early as 1908, Marinesco demonstrated a positive complement-fixation reaction between aqueous extracts of thyrotoxic thyroid gland and the serum of the patients from whom the glands were taken. His student, Papazolu,[1] extended these observations in 1911, observing complete or almost complete complement fixation with thyrotoxic gland extracts in twenty-six of thirty-eight

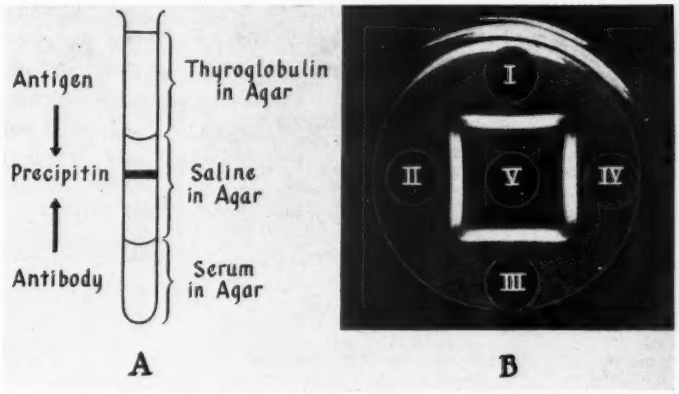


Fig. 5. A. Diagram of thyroglobulin precipitin test by a modified Oudin technique. Antigen and antibody diffuse toward each other through the saline zone, forming a precipitate when they meet in suitable proportions. (From Roitt and Doniach, Proc. Roy. Soc. Med., 50:958, 1957.)

B. Identification of thyroglobulin as the active antigen in the saline extract of thyroid using the diffusion-precipitation technique of Ouchterlony in agar gel. The five wells in the agar plate were filled as follows: I, Thyroglobulin, purified (5 mg./ml.). II, Thyroid extract (1:10). III, Thyroglobulin, purified (10 mg./ml.). IV, Thyroid extract (1:20). V, Hashimoto serum. The precipitation lines resulting from union of antigen and antibody after diffusion through the agar form a square. The confluence of the precipitation lines at the corners shows the identity of the antigens in the crude thyroid extract and the purified thyroglobulin. (From Doniach and Roitt, *J. Clin. Endocr. & Met.*, 17:1293, 1957.)

patients with Basedow's disease, but not in normal controls. He suggested that Basedow's disease was not only a state of hyperthyroidism but also of dysthyroidism.

In 1915, Beebe[2] treated Graves disease with thyroid antiserums, achieving a modicum of success.

In 1927, Hektoen, Fox, and Schulhof[3] observed the development of precipitating antibodies in the serum of rabbits receiving injections of saline extracts of thyroid, presumably thyroglobulin, from another species. These precipitins were organ-specific, reacting only to thyroid extracts, but not species-specific. They reacted to thyroid extract from a species different from the one used to stimulate the formation of antibodies.

In 1942, Lerman[4] injected human thyroglobulin into rabbits and detected circulating precipitins to rabbit thyroglobulin. Myxedema occurred in the immunized rabbits in a few instances.

Witebsky and Rose[5,6] and associates originally produced antibodies by sensitizing one rabbit to the thyroglobulin of another rabbit. They found it necessary to use Freund's adjuvant, a mixture of mineral oil and killed mycobacteria, to enhance and prolong the formation of antibodies. They demonstrated circulating antibodies by three procedures; precipitation (PPN), complement-fixation (CF), and tanned cell agglutination (TCA). In the TCA method, red cells are exposed to a weak solution of tannic acid to facilitate the adsorption of the antigenic protein. The coated red cells are then agglutinated in the presence of antibodies to the coating protein. The PPN test, in which undiluted rabbit serum was mixed with serial dilutions of thyroid extract, was very insensitive compared to the other two tests. Antibodies were demonstrated in 38 per cent of fifty rabbits by the CF method, and in 91 per cent of thirty-two rabbits by the TCA method. These

antibodies were specific for extracts of thyroid gland and did not react with extracts of other rabbit organs such as liver, spleen, kidney, heart, lung, pancreas, or adrenal. However, the anti-

Dilutions of Rabbit Serum	Rabbit No.*					
	417	418	419	420	421	422
1:5	++++	+++	++++	+++	+++	++++
1:10	+++	+++	++++	++	+++	++++
1:20	+++	+++	+++	++	+++	+++
1:40	+++	++	+++	++	+++	+++
1:80	++	++	+++	++	++	+++
1:160	++	++	++	−	++	+++
1:320	+	+	++	−	++	++
1:640	−	−	++	−	−	+
1:1,280	−	−	++	−	−	+
1:2,560	−	−	++	−	−	−
1:5,120	−	−	−	−	−	−

* Normal rabbit serum gave negative reaction in all dilutions.

Fig. 1. Agglutination of thyroid-coated human erythrocytes by serums of rabbits immunized two months previously with purified rabbit thyroglobulin. (From Witebsky et al, *J.A.M.A.*, 164:1439, 1957.)

bodies of any one rabbit reacted similarly to thyroid extracts from many different rabbits. Thyroidectomized rabbits produced antibodies to thyroid extract just as readily as those with intact

Dilutions of Thyroid Extracts	Rabbit Thyroid Extract				
	Normal	223	220	215	224
1:10	++	+	++++	+	++
1:100	++	+	++	++++	++++
1:1000	++++	−	−	+++	++++
1:10,000	++++	−	−	−	++
1:100,000	++	−	−	−	+
1:1,000,000	−	−	−	−	+
Saline	−	−	−	−	−

Fig. 2. Estimation of specific thyroid antigen content of rabbit thyroid glands by complement-fixation test, using rabbit antiserum containing high titer of organ-specific rabbit thyroid antibodies.

With normal rabbit thyroid a strong reaction is demonstrated with a high dilution of the thyroid extract. The other four rabbits had been previously immunized with thyroid gland extracts. Rabbit 223 had a high titer, 220 and 215 medium titers, and 224 but a trace of circulating antibodies. (From Rose and Witebsky, *J. Immunol.*, 76:417, 1956.)

thyroids. Also rabbits produced antibodies to injected extracts of their own thyroid glands.

Witebsky and colleagues[6,7] then prepared a nearly-pure rabbit thyroglobulin which was injected into the footpads of six rabbits in standard fashion. All six developed antibodies against rabbit thyroid extract as shown in Figure 1, suggesting that thyroglobulin was the constituent of thyroid extract responsible for the immunization measured by TCA.

The logical next step was to demonstrate, if possible, *in vivo* damage to rabbit thyroid glands in association with antibody formation. They[3] first showed that the measurable thyroid antigen content of thyroid glands of rabbits which had been immunized and had produced circulating antibodies was diminished, and that the decrease was related to the intensity of the antibody response of the rabbit (Fig. 2). This was verified in another group of nine rabbits in whom one-half of the removed thyroid gland was saved for

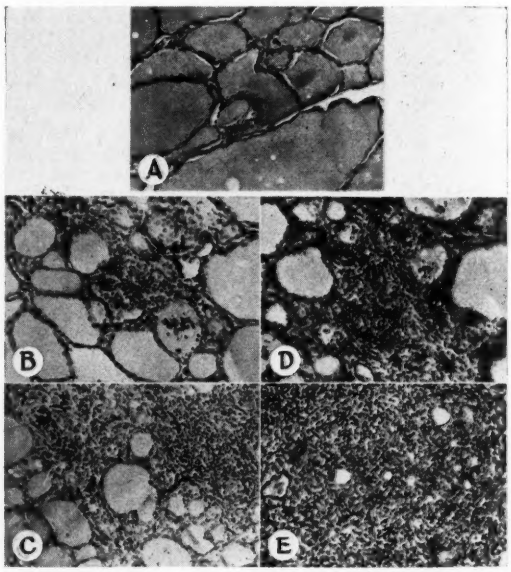


Fig. 3. Histologic alterations in rabbits immunized against pooled rabbit thyroid extract. A, normal rabbit thyroid. B, C, D and E show mild, moderate, severe, and very severe alterations, respectively, characterized by lymphocytic and eosinophilic infiltrations and accumulations, altered follicles with no colloid and fibrous tissue replacement. (From Rose and Witebsky, *J. Immunol.*, 76:417, 1956.)

histologic examinations. These[8] revealed alterations in the histology (Fig. 3) which prompted Douglas Riggs, a colleague with special interest in thyroid diseases, to say, "That looks like Hashimoto's thyroiditis."[9] The intensity of the histologic change, like the decrease in antigen content of the opposite lobe, was correlated with the titer of circulating antibodies (Fig. 4). These studies were confirmed with purified thyroglobulin, the histologic changes being similar. Similar results were also observed when the antigenic extract was injected into the same animal from whom the portion of thyroid gland used to prepare the extract originally came. These various findings were impressive evidence, indeed, for the presence of true auto-antibodies.

While this work was being pursued, an entirely different approach to the problem was started by Roitt and co-workers in England. These investigators had the happy thought that the increased gamma globulins in Hashimoto's thyroiditis probably reflected circulating antibodies to thyroglobulin. They extracted thyrotoxic or normal thyroid glands with saline, and prepared a purified thyroglobulin antigen from this. In their earliest report[10] this antigen was layered over the serum of nine patients with Hashimoto's thyroiditis yielding detectable precipitins in seven. They later[11-13] mixed the antigen and the serum with agar so that diffusion, mixing, and precipitation occurred very slowly in a gel medium (Fig. 5A). By this technique, precipitins were demonstrated originally in twenty-five of thirty patients with Hashimoto's disease. Similar precipitin reactions were found when purified thyroglobulin was used. That thyroglobulin was the antigen in the crude thyroid extracts was shown by confluence of the precipitation lines of purified thyroglobulin and thyroid extract on an Ouchterlony plate (Fig. 5B).

The antigens in the thyroglobulin and thyroid extract preparations were also found to have identical mobilities on immuno-electrophoresis in agar. As many as three distinct antigens could be identified in purified thyroglobulin by means of the precipitin reactions. Fractional electrophoresis of the Hashimoto serum showed that the precipitins were only in the gamma globulin fraction. The serums gave negative reactions to saline extracts of human liver, kidney, spleen, lymph node, parotid gland, and brain. A narrow species specificity was also demonstrated, serums reacting only with extracts from thyroid of the chimpanzee and monkey, in contradistinction to the early observations of Hektoen and his associates using rabbit antihuman thyroid serum.[3] High levels of circulating antibody were found—values as high as 5.2 mg. antibody protein per ml. serum being recorded. The molar ratios of antibody to antigen in the specific precipitates were low (4:1 to 2:1) indicating a small number of combining sites on the antigen.[13]

By the time their clinical paper was published, Doniach and Roitt had studied 144 cases of Hashimoto's disease finding precipitins in 109 or 76 per cent. The antibody titers tended to be highest in untreated patients, lower in those treated with desiccated thyroid, and often disappeared after thyroidectomy. They also demonstrated precipitins in six of thirty-three patients with myxedema, four of six with subacute thyroiditis, and in

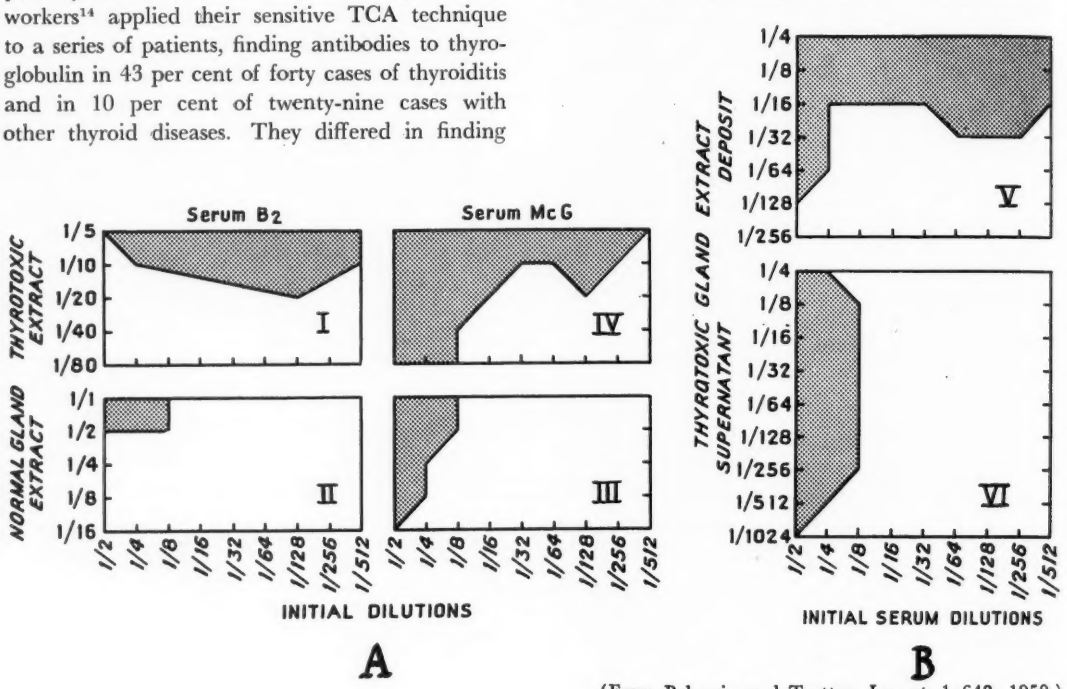
Rabbit Number	Material Used for Immunization	Serum Antibody*	Thyroid Extracts		Histologic Change
			Antigen content†	Nitrogen content‡	
288	Pooled rabbit thyroid extract	320	6400	0.10	Slight
289	Pooled rabbit thyroid extract	>10,000	800	0.14	Marked
290	Pooled rabbit thyroid extract	5,000	400	0.24	Marked
293	Pooled rabbit thyroid extract	80	3200	0.09	None
294	Pooled rabbit thyroid extract	>10,000	800	0.18	Marked
298	Pooled rabbit thyroid extract	160	3200	0.18	None
299	Pooled rabbit thyroid extract	640	1600	0.20	Moderate
401	Pooled rabbit thyroid extract	320	800	0.13	None
402	Pooled rabbit thyroid extract	>10,000	50	0.20	Marked
404	Pooled rabbit serum	0	1600	0.19	None
407	Pooled rabbit serum	0	1600	0.25	None
409	Pooled rabbit serum	0	1600		None
410	Pooled rabbit serum	0	1600		None
412	Pooled rabbit serum	0	3200		None
Normal 1	None	0	1600	0.25	
Normal 2	None	0	1600	0.26	
Normal 3	None	0	1600	0.24	
Normal 4	None	0	1600		
Normal 5	None	0	1600		

* Determined by hemagglutination of tanned human erythrocytes coated with 1:200 rabbit thyroid antigen boiled 2 min.
† Determined by complement fixation test, using rabbit thyroid antiserum 402c as specific reagent.
‡ Mg. Nitrogen/ml, determined by Folin-Ciocalteu method (see Methods and Materials).

Fig. 4. Correlation between circulating antibody titer (reciprocal shown), antigen content, and histologic changes in rabbits immunized against rabbit thyroid extract. The histologic changes in rabbits 288, 299, 289, and 402 are shown in Figure 3B, C, D and E, respectively. (From Rose and Witebsky, *J. Immunol.*, 76:417, 1956.)

none of 209 other patients with thyrotoxicosis, nodular goiter, or Reidels thyroiditis.[11]

With the publication of the first preliminary report by Roitt et al in 1956, Witebsky and co-workers[14] applied their sensitive TCA technique to a series of patients, finding antibodies to thyroglobulin in 43 per cent of forty cases of thyroiditis and in 10 per cent of twenty-nine cases with other thyroid diseases. They differed in finding no antibodies in fourteen patients with Hashimoto's thyroiditis; however, it is quite apparent from succeeding reports that this is a matter of pathologic definition of disease rather than of immunologic discrepancy. Goudie and co-workers[15] and Trotter and colleagues[16] promptly verified the observations of Roitt and Doniach in Hashimoto's disease. White[17] demonstrated that fluorescein-labeled antibody from a patient with Hashimoto's thyroiditis accumulated in the colloid of the remaining acini when the serum was brought in contact with slices of the patient's own thyroid. He also showed[9] that complement-fixing (CF) antibodies could be demonstrated in nearly every case of Hashimoto's disease when he used antigen prepared from thyrotoxic gland. Trotter and colleagues[16] made the same observation, but noticed in addition that antigen from normal glands was ineffective. They suspected that the antigen of the complement-fixation reaction was different from that of the precipitin reaction, a suspicion that was borne out later as we shall see.



(From Belyavin and Trotter, *Lancet*, 1:648, 1959.)

Fig. 6. A. Complement-fixation patterns obtained with two human Hashimoto serums when tested against normal and thyrotoxic thyroid gland extracts.

I. Antibody-sensitive pattern. Reaction to "microsome factor" antigen.
II. Very little reaction.
III. Antigen-sensitive pattern. Reaction to thyroglobulin antigen.
IV. Mixed antibody-sensitive and antigen-sensitive patterns.

B. Separation of the two complement-fixation patterns from the same sample of thyrotoxic gland extract (serum McG) by high-speed centrifugation.

V. Antibody-sensitive component of reaction IV.
VI. Antigen-sensitive component of reaction IV.

The early observations so far outlined, led directly to much further work of an expanded nature, and within the past year, it has become quite evident that more than one thyroid antigen is involved, and that auto-antibodies can be detected in many types of thyroid diseases besides thyroiditis.

Roitt and Doniach,[18] following the lead of Trotter and co-workers, found that the CF antibody

was distinct from the precipitin, in that absorption of precipitins from Hashimoto's serum with thyroglobulin had no effect on the titer of CF antibody. As with precipitins, only the gamma

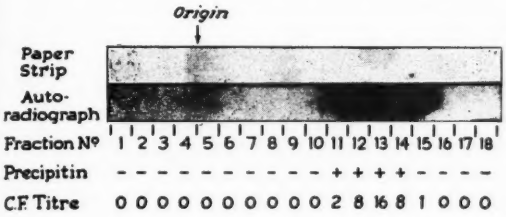


Fig. 7. Immunoelectrophoresis and autoradiography of the electrophoretic strip of a radioactive thyroid extract, showing correspondence between site of precipitating antigen, complement-fixing antigen, and radioactive thyroglobulin. (From Anderson, Goudie and Gray, *Lancet*, 1:644, 1959.)

globulin fraction of serum gave a positive complement-fixation reaction. Cell fractionation studies of homogenates of fresh thyrotoxic gland revealed the CF antigen to be localized to the microsome fraction. It is thus an intracellular antigen in contrast to thyroglobulin which is an intrafollicular antigen. The richest source of CF antigen was thyroid from hyperthyroid patients; however, they thought they detected it in normal thyroids. This CF antigen was organ-specific and cross-reacted only with thyroid from closely related species (chimpanzee and monkey).

These observations have been verified by Belyavin and Trotter[19] who also found that the CF antigen from thyrotoxic glands was localized to the microsome fraction of thyroid cells. They distinguished this CF reaction to a "microsome factor" antigen (which they called antibody-sensitive based upon the CF pattern—shown in Figure 6) from a second CF reaction to thyroglobulin (which they called antigen-sensitive and which occurred in a few Hashimoto serums). They also established that the thyroglobulin concentration of thyroid gland extracts was independent of the total complement-fixing potency. The CF reaction to thyroglobulin has been studied in some detail by Anderson, Goudie, and Gray.[20] On the basis of immuno-electrophoretic correlations (Fig. 7), and demonstration of the reaction with chemically-purified thyroglobulin, they concluded the CF antigen in non-toxic thyroid extracts must be thyroglobulin. The CF antibodies to thyroglobulin were only present in low titers and could be blocked by precipitins. They do not contribute significantly to the CF antibodies formed in response to extracts of thyrotoxic thyroid glands.

Anderson, Goudie, and Gray[21] also studied the CF reaction to extracts of thyrotoxic glands in some detail. They found the antigen equally abundant in glands from thyrotoxic patients and goitrous cretins, favoring the idea that its abundance is related to epithelial hyperplasia. They presented evidence that a single antigen-antibody system was involved and that the reaction was

TABLE I. INCIDENCE OF CIRCULATING THYROID ANTIBODIES IN VARIOUS THYROID DISEASES

(Data of Roitt & Doniach[18])

Disease	No. of Cases	Per Cent Pos.*	Per Cent Positive**		
			CF	TCA	PPN
Controls	343	5	0	5	—
Hashimoto's	106	98	91	91	67
Myxedema	101	83	64	66	19
Thyrotoxicosis	181	64	37	57	1
Non-toxic nod. G.	198	32	9	27	1
Thyroid Ca	39	29	8	25	—
Sub. thyroiditis	19	68	—	—	—

*positive by any method.
**CF, complement-fixation. TCA, tanned cell agglutination. PPN, Precipitation.

auto-immune in nature. A characteristic reaction pattern was observed in which the titer of the serum was nearly constant with all reacting dilutions of extract, and conversely. Also the titer of thyroid extract was constant when tested with different positive serums. Autologous tests in which both the serum and thyroid extract came from the same individual were performed on seven thyrotoxic patients, being positive in all.

It thus seems reasonably clear at this point that two different antigens can stimulate antibodies to thyroid tissue. One is thyroglobulin to which precipitating, tanned cell agglutinating, and complement-fixing antibodies have been demonstrated. The other is an unknown substance in the microsomes of thyroid cells to which only complement-fixing antibodies have been demonstrated.

These observations have been a stimulus to reconsiderations of the incidence of thyroid auto-antibodies in the major thyroid diseases. Roitt and Doniach[18] measured thyroid auto-antibodies in large groups of patients by three techniques simultaneously—PPN, TCA, and CF with extracts of thyrotoxic glands. With the more sensitive and all-inclusive methods they found a high incidence of antibodies in various thyroid diseases (Table

I), most prominently in Hashimoto's thyroiditis and myxedema where the highest titers were found. In general, low titers were found in the other thyroid diseases and were associated with

TABLE II. INCIDENCE OF CIRCULATING THYROID ANTIBODIES IN VARIOUS THYROID DISEASES

(Data of Belyavin & Trotter[19] and Anderson, Goudie & Gray[21])

Disease	Belyavin & Trotter			Anderson, Goudie & Gray		
	No. of Cases	Per Cent Positive		No. of Cases	Per Cent Positive	
		CF	PPN		CF	PPN
Controls	36	5	0	486	7	0*
Hashimoto's	64	80	42	60	87	70
Myxedema	19	53	21	90	53	14
Thyrotoxicosis	66	42	9	247	52	2
Simple goiter	33	12	0	44	9	0
Thyroid Ca	25	24	24	—	—	—

*Based upon 133 cases.

localized lymphoid infiltrations. The concentration of antibodies would often parallel the course of the disease, as exemplified by the following sequence of approximate concentrations of thyro-

TABLE III. INCIDENCE OF CIRCULATING TCA ANTIBODIES IN HASHIMOTO'S THYROIDITIS AND MYXEDEMA

(Data of Owen & Smart[22])

Disease	No. of Cases	Per Cent Pos.	Per Cent Positive*		
			1	2	3
Controls	52	6	6	0	0
Hashimoto's <1 year	34	85	12	20	53
Hashimoto's >1 year	43	77	40	19	18
Myxedema	78	81	49	29	3

*1=Weak or moderate titer.
2=Strong titer.
3=Very strong or gross titer.

globulin precipitins in a case of subacute thyroiditis:

Months after onset of illness:	1	2	3	7	16
Antibody in μg/ml. serum:	450	700	700	560	150

Their myxedema patients with negative results had long-standing and severe disease. They even found the serologic tests useful in detecting patients with mild hypothyroidism whose thyroid function tests were equivocal.

Belyavin and Trotter[19] and Anderson, Goudie and Gray,[21] using the CF test with thyrotoxic thyroid confirmed these incidence figures, as shown in Table II.

The observations in myxedematous patients were corroborated by Owen and Smart[22] whose results

TABLE IV. INCIDENCE OF CIRCULATING THYROID ANTIBODIES IN VARIOUS THYROID DISEASES

Cumulative Experience*

Disease	CF		TCA	
	No. of Cases	Per Cent Pos.	No. of Cases	Per Cent Pos.
Controls	717	5	539	4
Hashimoto's	230	87	199	86
Myxedema	210	59	189	72
Thyrotoxicosis	494	45	301	47
Non-toxic goiter	275	9	217	28
Thyroid Ca	61	15	36	25

*Data from Roitt & Doniach,[18] Belyavin & Trotter,[19] Anderson et al,[21] Owen & Smart,[22] Blizzard et al.[23] Cline et al.[24]

with the TCA method are shown in Table III. They found that myxedema patients were similar to Hashimoto's cases of long duration in the incidence of various titers of circulating antibody,

TABLE V. INCIDENCE OF CIRCULATING THYROID ANTIBODIES IN PATIENTS WITHOUT THYROID DISEASE

Cumulative Experience

Author	Test	No. of Cases	Per Cent Pos.
Roitt & Doniach[18]	CF	195	0
	TCA	148	5
Witebsky et al[14]	TCA	120	0
Belyavin & Trotter[19]	CF	36	5
	PPN	36	0
Goudie et al[15]	PPN	133	0
Owen & Smart[22]	TCA	52	6
Goudie et al[23]	CF	486*	7
Blizzard et al[26]	TCA	219	4
Totals	CF	717	5
	TCA	539	4
	PPN	169	0

*Including 142 women over 50 years of age of whom 16% had positive tests.

having more low titers than high. Hashimoto's cases of recent onset had roughly the same total incidence but many more with high titers of antibody. These results, added to those of the others, support the idea that spontaneous myxedema, like chronic thyroiditis, may be the end result of thyroid auto-immunization. These immunologic observations also support the inferences from histologic studies, that Hashimoto's thyroiditis and spontaneous myxedema arise from the same or similar pathologic processes.

The incidence of circulating antibodies in patients with various thyroid diseases (Table IV) is in striking contrast to that observed in patients without thyroid disease, where no matter what method or what author, the incidence figures are low (Table V).

Several other correlations have been established between pathologic anatomy and circulating antibody levels. Stuart and Allan[25] observed a direct relationship between basement-membrane irregularities in the thyroid follicles and the occurrence of high antibody titers in thirty-one patients with thyrotoxicosis, Hashimoto's disease, or subacute thyroiditis. The basement-membrane changes were widespread and severe in the cases with thyroiditis and of lesser degree in those with thyrotoxicosis. They were usually associated with lymphocytic and plasma cell infiltrations.

TABLE VI. ASSOCIATION BETWEEN RESULTS OF SKIN TESTS WITH THYROID EXTRACT AND CIRCULATING PRECIPITATING ANTIBODIES

(Data of Buchanan et al[30])

PPN Test*	Skin Test		
	Negative	Weak	Strong
Positive (15)	27%	7%	66%
Negative (37)	87%	13%	0%

*No. of cases in parentheses.

Goudie, Anderson, and Gray[26] recorded autopsy findings in seventy-seven patients without known thyroid disease who had complement-fixation tests. Nine had positive tests. Eight of these were women who had a common abnormality of the thyroid gland—lymphocytic infiltration associated with large eosinophilic flattened thyroid epithelial cells which form small acini containing little or no colloid. The ninth was a man whose complement-fixation reaction was not specific and whose gland was normal. Four of the eight women had hepatic cirrhosis. Of 486 patients with a wide variety of diseases only those with a diagnosis of liver necrosis and cirrhosis had a significant incidence of positive thyroid complement-fixation tests. Of 300 postmortem thyroids examined, eleven were from women with hepatic necrosis or cirrhosis, and seven of them showed the thyroid changes described above. A very suggestive association is evident between the thyroid abnormality and liver cirrhosis in women. Luxton[27] had observed the occurrence of post-necrotic cirrhosis in a woman with Hashimoto's thyroiditis. The hepatic fibrosis in association with plasma cell and lymphocytic infiltration tempted him to speak of "Hashimotosis of the liver." I suspect a significantly increased incidence of positive complement-fixation tests and microscopic thyroid abnormalities would be found, if looked for, in the kind of patients with liver abnormalities described by Bearn, Kunkel, and Slater[28] and by Bartholomew, Hagedorn, Cain, and Baggenstoss.[29] Many of us are suspicious of an auto-immune mechanism in the etiology of post-necrotic cirrhosis. Perhaps auto-antibodies form a common denominator between this liver abnormality and Hashimoto's thyroiditis.

It is quite apparent from this brief résumé that the original view that thyroid auto-antibodies are of importance mainly in Hashimoto's thyroiditis has had to be modified quickly. So has the original view of pathogenesis which supposed that leakage of thyroglobulin due to thyroid damage led to antibody formation, which in turn attacked and further damaged the gland, starting a chain reaction. On the other hand, the suggestion that spontaneous myxedema may be the end result of auto-immunity and thyroiditis has been strengthened.

The possibility exists that the presence of circulating antibodies in thyroid disease is an incidental by-product of the damage to the gland. However, this would not explain the experimental production of comparable lesions in rabbits immunized against their own thyroids. A more likely possibility, suggested by Roitt and Doniach, is that the antibodies act indirectly by a delayed hypersensitivity reaction. The fact that Freund's adjuvant containing killed tubercle bacilli had to be used by Witebsky and Rose to get any significant thyroid damage in rabbits, favors this hypothesis. The positive skin tests observed by Buchanan, Anderson, Goudie, and Gray[30] with thyroid extracts also favor this. They showed that intradermal injection of a saline extract of thyroid gave a tuberculin-like skin reaction in patients with thyroid disease, particularly those with Hashimoto's thyroiditis or primary myxedema. Strongly positive reactions were seen only in those with circulating precipitins (Table VI). With one exception, positive skin reactions did not occur in controls without thyroid disease. Biopsy of an area of strong reaction revealed edema and hemorrhage into the skin with polymorphonuclear infiltrations. Some such sensitization may be the essential factor in thyroid damage. Other antibodies besides those so far identified may cause the actual damage to the thyroid, those we measure being indicators but not the cytotoxic agents.

This is as far as the path goes along the autoantibody trail. Reports will be appearing "thick and fast," and what is concluded today will undoubtedly be modified tomorrow. Whatever the outcome, this is clearly a fascinating and fruitful development in the field of thyroid diseases.

Acknowledgments

I am grateful to the authors of the articles cited and to the editors and publishers of the journals in which the papers appeared, for their kind permission to reproduce their work in this review.

Addendum

Since submission of this paper, Pulvertaft, Doniach, Roitt, and Vaughan Hudson (Lancet 2:214, 1959) have reported on the cytotoxic effects of Hashimoto serum on human thyroid cells in tissue culture. Surgically excised thyroid glands were prepared by trypsin dispersal of the thyroid cells, and direct examinations for cytotoxic changes were made by phase contrast microscopy after incubation with normal and Hashimoto serum. Thyroid cells in contact with normal serum survive unchanged up to eighteen days. With Hashimoto serum, few surviving thyroid cells are seen at eighteen hours, even though lymphocytes, monocytes, and neutrophils from the same gland retain their normal appearance and motility. Replacement of normal with Hashimoto serum after incubation for eighteen hours resulted in cytotoxic changes rapidly. Hashimoto serum destroyed thyroid cells cultured from the patient's own gland as well as from thyrotoxic and non-toxic nodular glands. Thyroid cells grown in normal serum for more than thirty-six hours seemed to acquire a protective coating and could no longer be affected by Hashimoto serum. Heating Hashimoto serum at 56° C abolished its cytotoxic effect, indicating that the cause of the cytotoxic action was not the antibodies to the microsomal factor or thyroglobulin, since these antibodies are heat stable.

References

1. Papazolu, A.: Contributions a l'Etude de la Pathogenie de la Maladie de Basedow. Comptes Rendus Societe de Biologie, 71:671, 1911.
2. Beebe, S. P.: The serum treatment of hyperthyroidism. J.A.M.A., 64:413, 1915.
3. Hektoen, L., Fox, H., and Schulhof, K.: Specificness in the precipitin reaction of thyroglobulin. J. Infect. Dis., 40:641, 1927.
4. Lerman, J.: Endocrine action of thyroglobulin antibodies. Endocrinology, 31:558, 1942.
5. Witebsky, E., and Rose, N. R.: Studies on organ specificity. IV. Production of rabbit thyroid antibodies in the rabbit. J. Immunol., 76:408, 1956.
6. Witebsky, E., Rose, N. R., Terplan, K., Paine, J. R., and Egan, R. W.: Chronic thyroiditis and autoimmunization. J.A.M.A., 164:1439, 1957.
7. Shulman, S., Rose, N. R., and Witebsky, E.: Studies in organ specificity. III. Ultracentrifugal and electrophoretic examinations of thyroid extracts. J. Immunol., 75:291, 1955.
8. Rose, N. R., and Witebsky, E.: Studies of organ specificity. V. Changes in the thyroid glands of rabbits following active immunization with rabbit thyroid extracts. J. Immunol., 76:417, 1956.
9. Leading Article: The immunology of thyroid disease. Lancet, 1:1075, 1957.
10. Roitt, I. M., Doniach, D., Campbell, P. N., and Vaughan Hudson, R.: Auto-antibodies in Hashimoto's disease (lymphadenoid goitre). Lancet, 2: 820, 1956.
11. Doniach, D., and Roitt, I. M.: Auto-Immunity in Hashimoto's disease and its implications. J. Clin. Endocrinol., 17:1293, 1957.
12. Roitt, I. M., and Doniach, D.: Auto-immunization in thyroid diseases. Proc. Roy. Soc. Med., 50:958, 1957.
13. Roitt, I. M., Campbell, P. N., and Doniach, D.: The nature of the thyroid auto-antibodies present in patients with Hashimoto's thyroiditis (lymphadenoid goitre). Biochem. J., 69:248, 1958.
14. Paine, J. R., Terplan, K., Rose, N. R., Witebsky, E., and Egan, R. W.: A clinical study of chronic noninfectious thyroiditis and autoimmunization. Surgery, 42:799, 1957.
15. Goudie, R. B., Anderson, J. R., Gray, K. G., Clark, D. H., Murray, I. P., and McNichol, G. P.: Precipitin tests in thyroid disease. Lancet, 2:976, 1957.
16. Trotter, W. R., Belyavin, G., and Waddams, A.: Precipitating and complement-fixing antibodies in Hashimoto's disease. Proc. Roy. Soc. Med., 50:961, 1957.
17. White, R. G.: An immunological investigation of Hashimoto's disease. Proc. Roy. Soc. Med., 50:953, 1957.
18. Roitt, I. M., and Doniach, D.: Human autoimmune thyroiditis: Serological studies. Lancet, 2:1027, 1958.
19. Belyavin, G., and Trotter, W. R.: Investigations of thyroid antigens reacting with Hashimoto sera. Evidence for an antigen other than thyroglobulin. Lancet, 1:648, 1959.
20. Anderson, J. R., Goudie, R. B., and Gray, K. G.: Complement-fixing autoantibody to thyroglobulin in Hashimoto's disease. Lancet, 1:644, 1959.
21. Anderson, J. R., Goudie, R. B., and Gray, K. G.: The 'thyrotoxic' complement-fixation reaction. Scot. Med. J., 4:64, 1959.
22. Owen, S. G., and Smart, G. A.: Thyroid antibodies in myxedema. Lancet, 1:1034, 1958.
23. Blizzard, R. M., Hamwi, G. J., Skillman, T. G., and Wheeler, W. E.: Thyroglobulin antibodies in multiple thyroid diseases. New England J. Med., 260:112, 1959.
24. Cline, M. J., Selenkow, H. A., and Brooke, M. S.: Autoimmunity in thyroid disease. New England J. Med., 260:117, 1959.
25. Stuart, A. E., and Allan, W. S. A.: The significance of basement-membrane changes in thyroid disease. Lancet, 2:1204, 1958.
26. Goudie, R. B., Anderson, J. R., and Gray, K. G.: Complement-fixing antithyroid antibodies in hospital patients with asymptomatic thyroid lesions. J. Path. & Bact., 77:389, 1959.
27. Luxton, R. W.: Discussion on Hashimoto's disease. The clinical aspect. Proc. Roy. Soc. Med., 50:943, 1957.
28. Bearn, A. G., Kunkel, H. G., and Slater, R. J.: The problem of chronic liver disease in young women. Am. J. Med., 21:3, 1956.
29. Bartholomew, L. G., Hagedorn, A. B., Cain, J. C., and Baggenstoss, A. H.: Hepatitis and cirrhosis in women with positive clot tests for lupus erythematosus. New England J. Med., 259:947, 1958.
30. Buchanan, W. W., Anderson, J. R., Goudie, R. B., and Gray, K. G.: A skin test in thyroid disease. Lancet, 2:928, 1958.

Editorials

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CIRCUMSCRIBED PULMONARY LESIONS

The following outline is offered to physicians encountering lesions of the lung, mainly as a plea against complacency in diagnosing conditions which appear to be benign but may definitely be found to be malignant upon closer observation.

Coin Lesions of the Lung

(a) Single
(b) Circumscribed
(c) Noncavitary
(d) Without distal obstructive changes

Types of Coin Lesions

Malignant—one-third
- Primary bronchogenic carcinoma
- Alveolar cell carcinoma
- Metastatic carcinoma or sarcoma
- Bronchial adenoma
- Primary connective tissue tumors
- Mesothelioma

Benign—two-thirds
- Granulomas
  - Tuberculosis
  - Fungi
- Hamartomas
- A-V fistula
- Abscess
- Hematomas

Specific Information for Diagnostic Workup in Coin Lesions

(a) Old films
(b) Skin tests
(c) Tomograms (to reveal calcium)
(d) Cytology (if raising sputum)
(e) Bronchoscopy (only if centrally located)
(f) History of hemoptysis
(g) Sedimentation rate
(h) Search for primary tumor

Calcification in Coin Lesions

If calcium is
(a) Solid or diffuse
(b) Laminated
(c) Central core
then benign.

If calcium is
(a) In flecks
then may be malignant.

Calcified Coin Lesions (Benign)

Removed surgically if:
(a) They enlarge
(b) Develop radiolucency
(c) Become symptomatic (because of spread of infection, not cancer).

After All Tests Are Completed, two-thirds or more of lesions remain a mystery (depending on cytology laboratory).
Final test—Exploratory Thoracotomy

At Thoracotomy—

Biopsy
- Enucleation (hamartoma)
- Wedge resection
- Segmental resection
- Lobectomy

One-half of specimen for pathology and
One-half for bacteriology
Definitive surgery
- Further resection or not, depending on fresh frozen tissue diagnosis.

Malignant Coin Lesions

Survival good if asymptomatic and removed early.
Absence of blood vessel invasion most important in prognosis.
Peripheral location enhances resectability.

Coin Lesion in Twenty-Year-Old Most Difficult Decision

If calcified—no surgery
Not calcified—possible surgery
- Could be adenoma, A-V fistula, abscess, or metastatic carcinoma or sarcoma.

Each case is individualized.

Summary—Coin Lesions

(a) One-third are malignant
(b) Few are diagnosable without exploratory thoracotomy.
(c) Complacency will lead to trouble.
(d) Conservative resection for fresh frozen tissue diagnosis.
(e) Risk roughly is that of laparotomy

ROBERT W. JAMPLIS, M.D., ET AL
Palo Alto Clinic

reading, Reading, READING

Dr. Randall Jarrell, in a *Saturday Evening Post* article, "The Appalling Taste of Our Age," states that words are the chief American industry. The opinion is substantiated by Dr. I. Donald Fagin's statistics published in the September 1959 issue of the *Mississippi Valley Medical Journal:* "... in 1957, more than 200,000 medical articles appeared in over 4,000 medical journals; 659 journals of medical interest were published in the United States alone."

The main points of Dr. Fagin's succinct article are the pertinent discussion of five motives for publication and six solutions to the problem of "Too Many Words" in medical literature. The solutions are given, Dr. Fagin concludes, "without much hope that they will meet with approval except by the medical *reading* public." If the seemingly inexhaustible writings are to continue to pour in, the reader must do something about his part in the communication process: "receiving" the meat of the writing that the "sender" is issuing.

The components of an effective reading pattern are these:

1. *Confidence.*—A person can read just as fast as he thinks he can. We have mental blocks on our reading proficiency, which discourage our even starting to read a given piece of literature. Here, *confidence* implies that faith which comes from a knowledge of the task to be accomplished.

2. *A Brief Fixation Time.*

3. *A Wide Reading Span.*—In connection with these two aspects of the reading process, a representative of the American Optical Company states that the average reader *can* read twenty to twenty-five printed characters at 1/100th of a second; the average reader does read ten to twelve characters at 1/25th of a second.

4. *Absence of Vocalization.*—Ineffective readers vocalize in two areas: (a) with the lips and (b) in the larynx. A third spot in which words are "said" is in the brain. Despite the controversy on the point as to whether this is a form of vocalization, the more efficient reader is not conscious of word formation as he reads; the imprint on his consciousness is an idea, the objective of most contextual reading.

5. *Avoidance of Regressions.*—At the Reading Center in New York City, the statement is made that because of regressions (going back to pick up a point), the average reader spends ten times as much time as he need spend on a given piece of reading. If this figure strikes you as incredible or exhorbitant, check yourself the next time you are aware of regressing in reading. You will, in all probability, come to accept the figure as not unreasonable.

6. *A Rhythmic Reading Pattern.*—To establish a rhythmic pattern to suit the purpose and type of the reading being done helps to break word-reading. The two-, three-, or four- fixation-per-line pattern is recommended for the beginning reader and for certain types of literature. The proficient reader may read diagonally from the upper left-hand to the lower right-hand margin, or he may fix only in the center of the lines and read directly down the center of the page. Such known patterns among some readers are usable, *depending upon the purpose of the particular reading.*

7. *A Flexible Pace.*—The "poor" reader reads everything he approaches at the same rate. In newspaper reading, the international news, the sports, the editorial page, the comics—all of these features are read without consideration of their importance to the individual reader, and usually at a plodding, pedestrian rate. However, there are those who need to "reduce speed" for fulfilment of their reading purposes.

8. *Concentration.*—This highly intangible quality of reading is contingent upon development of the other components. The old wives' tale that "The slow reader gets more out of his reading" has been disproved. Testing has shown that it is the slow reader who regresses because of lack of

concentration, the end result of the reading being minimum retention of the material read.

You can make three approaches to your reading improvement.

1. *On your own, with your every-day professional and leisure reading.*

As in any self-development, or do-it-yourself campaign, this is the most difficult of the three approaches to pursue. Confidence runs low; self-motivation peters out; empirical, inaccurate testing of possible progress is less than satisfying. However, a few suggestions:

(a) Devote a given time—ten to fifteen minutes a day will pay dividends—to losing some of the old, costly reading patterns.

(b) Draw two or three light vertical equidistant lines (depending upon width of the column) down the columns of three or four columns of the newspaper or journal you wish to read. These lines serve as your fixation points, to discourage word-reading and sweeping back to the left margin, and to encourage a rhythmic pattern.

(c) Since the purpose in reading many of the popular comics is enjoyment of the punch line in the last frame, develop better reading habits by reading the balloons (the characters' dialogue) by the line, rather than by the word. With concentration, you can read many of the shorter "speeches" in one fixation. The very nature of the majority of the comics and the style of print make this homely exercise an effective aid in reading improvement.

(d) Discipline yourself brutally to break the habit of regressing. "Going back" is a luxury almost all readers cannot afford.

(e) Force yourself to read faster by scanning short newspaper articles and magazine news items. The brevity of these features lends itself to a quick self-test on how much information and detail you are able to assimilate. Caution: keep in mind that some of the details in the articles are likely unimportant and unnecessary to your purpose in reading the particular piece; so, don't assume that fallacious notion that you should remember *everything* included in the writing.

(f) Develop a flexible pace. Determine your purpose for reading a given piece and establish a pattern to achieve that purpose.

2. *The workbook or machine approach to assist in the self-help campaign.*

There are literally scores of workbooks on the market. In price they run from seventy-five cents to around six dollars. In choosing a book, you would do well to select one that gives a great deal of space to exercises and drills involving reading. Many of these publications spend too many pages on general discussion of reading and too little in involving the reader in actual improvement. In reading, as in any other endeavor, learning results from doing, not from reading about how to do.

Electric and pneumatic reading machines are geared for variable rates, the speed to be determined by the reader. These machines have a shutter, a rectangle of reflected light, or a rod moving down the page to pace the reader.

The five or six best known of these machines range in price from thirty-five dollars to approximately one hundred dollars.

In addition to helping break inefficient reading habits, the value of pacers to the individual is twofold. They serve as a motivator; too, they give the reader rather accurate evidence of his progress.

Some use is made by individuals of the various tachistoscopic (flash meter) devices on the market. These aid in widening the reading span and reducing fixation time.

3. *Formal class training in developmental reading.*

The advantages of having formal training under the direction of a qualified teacher are apparent, especially in a skill subject such as reading. Because developmental reading encompasses considerably more than mere increase in rate, the teacher is indispensable to the individual in this training if the objectives of the course include more than just improvement of the physical aspects of the reading process.

If you contemplate enrolling in a reading course or instituting such a course in your training program, consider two or three factors well. (a) The course should be at least 10 weeks long. (b) Classes should meet more often than once a week. (c) At least thirty hours should be devoted to the training.

Purdue University's extensive ten-year experience in developmental reading has acquainted the personnel with all phases of materials, equipment, and curriculums. (Incidentally, about 1000 students take the course each semester. The average gain in rate of speed is approximately 100 per cent with some gain in comprehension). Too,

Purdue has personnel to establish or conduct developmental reading courses for educational and industrial organizations.

If you decide to improve your reading habits (the first step is the firm decision), you can. Any *conscientious, sustained* effort in reading improvement will pay dividends. Dividends in less strain in workaday reading and more pleasure in leisure reading.

E. GLENN GRIFFIN

EMPLOYMENT PROBLEMS OF OLDER WORKERS

At the turn of the century, only four out of ten persons in the United States could expect to see their sixty-fifth birthday. Now, thanks to the results of scientific research, two out of three reach that age. This extension of life expectancy has pushed the average age from forty-five in 1900 to seventy today. An examination of the same period reveals that the total population doubled, while the number in the forty-five to sixty-four age group tripled, and the number in the sixty-five and over group quadrupled. And we are still adding years of life. Eminent medical authorities report that the human body is engineered to live up to 125 years, if in good health, and they believe that the average life span of individuals born in 1975 may well be close to ninety years.

All this means one thing—that people in the United States are living longer and consequently can look forward to more years of activity and productivity. It is at this point—the growing gap between the life span of the average American and the span of his work life—that one of today's most serious social problems appears.

The problem is based primarily on the fact that personnel policies and hiring practices relating to workers aged forty or over have not kept pace with advances made in medical science or in industry, or with conditions under which people live and work today. The erection of arbitrary age barriers to employment flag down some people at age thirty-five, and even earlier in some occupations. The critical age area, however, based on studies by the U. S. Department of Labor, appears to be age forty-five. Further research by the Minnesota Department of Employment Security points out that 75 per cent of the job openings received by the Twin Cities State Employment Service offices carry age restrictions, with 54 per cent barring from consideration workers over forty-five.

A closer look at population figures of this age group reveals some dramatic statistics regarding the scope of the problem. In 1900, citizens forty-five and over numbered 13.5 million. By 1955, this figure had exploded to 47.5 million; now the U. S. Bureau of the Census estimates this age group will soar to 56.5 million by 1965.

One-third of the persons coming into the Minnesota State Employment Service offices seeking employment are over age forty-five; yet we are able to find jobs for only one-fifth of them.

When older persons are excluded from gainful employment, the proportion of producers to consumers is reduced. This reduction causes lower standards of living, restriction of earning power, loss of individual dignity and self respect, and family and social pressures—all adding up to higher taxes to cover increasing costs of assistance, relief, and welfare programs.

Far too many employers cling to the notion that theirs is a young man's business. Their attitude appears to be that time is the true measure of an individual's age. This belief overlooks the fact that some people are young at seventy and others are old at forty, and it seems to support the idea that a man can be a valuable and productive worker one day, reach a magic age, and be a dud the next day. Chronological age is not a reliable measure of a man's productive capacity and, sooner or later as more and more workers join the ranks of the forty-plus, the traditional attitudes which are responsible for age restrictions will have to give way to the simple truth that ability is the logical guide to hiring.

But while the plight of the older worker is attributable primarily to the erection of arbitrary age restrictions, other factors contribute to the problem. Decreasing opportunities in agriculture and self-employment, for example, have forced many older persons into inactivity in rural areas or into migration to urban areas where their lack of marketable skills intensifies their employment problems. This situation is serious and requires careful evaluation of work potentials and possible vocational training.

Many older job seekers often create their own problems. Because they have worked for a long period of time, many do not know how to look for a job. Many fear the changes and adjustments they will have to make. Many worry about being rejected; and when their job-hunting efforts are unsuccessful, they adopt a defeatist attitude which

only complicates their problem. Many lack a realization of their own limitations and continue to make unrealistic demands for wages, locations, or working conditions. On the other hand, many sense that they are slowing down and either talk about it too much to the employer or cover it up to their own disadvantage. Because many are insecure, they resist changes in occupation and pay and find it difficult to adjust to new people and situations.

The negative factors just outlined are surpassed by the favorable attributes of older workers. Their reliability, serious attitude, and definite desire to work are important. Probably more important is the fact that they can bring to the employer maturity; maturity based on years of experience and the development of skills, knowledge and abilities. With the combination of all these positive factors, they can offer the employer a tremendous potential.

Armed with the knowledge of the older worker and his problems, many unions, religious groups, and other organizations are counseling older workers in an effort to prepare them for the time when they may have to consider a re-evaluation of their skills for entry into other types of work.

The Minnesota Department of Employment Security is applying its research findings to actual operations. Its offices in Minneapolis, St. Paul, and Hopkins have set up special services for older job seekers, and plans are under way for extending the program to the other thirty offices throughout the state. Special services for older workers require specialized employment counseling, testing, intensive job development and other placement activities. The plan is to assist in every possible way, qualified older workers and to promote for them equal opportunities for employment in competition with other workers with similar qualifications.

The program is based on a three-way educational approach. First, Employment Service staff members are receiving training designed to equip them to work effectively with older applicants. Second, older workers themselves are being briefed regarding the best methods for conducting job search campaigns. Third, intensive educational efforts are directed at employers urging them to hire on the basis of qualifications regardless of age.

This program, established late in 1956, is moving from its formative stages and is beginning to show results. Placements of older workers have shown a definite increase. This gain is significant in that it occurred during a period of difficult labor market conditions.

It is clear, however, that more is needed than even the best service the Employment Service can offer. Our efforts must be supplemented by an aroused community consciousness as to the need for positive action in meeting the employment problems of Minnesota's forty-plus citizens.

MERLE S. KINVIG
Minnesota Department of Employment Security

AVAILABLE OPPORTUNITIES FOR BETTER HEALTH

Good health is man's most important asset, and one would naturally think that everybody would take advantage of all that medical science has to offer for the preservation and maintenance of health. Unfortunately, this is not true, for a much too large percentage of people are still not availing themselves of all these better health opportunities.

Fortunately, just during the past few decades, medical science has shown remarkable progress. Advances in medical research have resulted in the development of many new discoveries, new technical accomplishments, new drugs, and better facilities for the diagnosis, prevention, and cure of disease.

Large sums are being contributed to and spent annually by organizations engaged in medical research, public health education, and preventive medicine. Large expenditures are being made for the construction of new hospitals, clinics, and diagnostic centers, where better facilities are provided for the diagnosis and treatment of disease. Such organizations as the U. S. Public Health Service, the American Cancer Society, the polio foundation, the various heart associations, the tuberculosis associations, and many others are engaged in public health education and research for the prevention and cure of disease.

Throughout the country, industry is also contributing toward the health of employes. Industry has developed safety programs and safety devices for the education and protection of the worker. Most industries have established medical departments with medical personnel engaged in industrial medicine and surgery for the benefit of their employes. Periodic and interval physical examinations of employes are made in an attempt by industry to

properly evaluate the health of the employe and preserve his employability. Industry is continuously making an effort to retain employes on the job by proper placement at work within the capabilities of their physical condition. Industry has found that it is much more difficult to replace experienced and well trained employes than it is to replace machines.

Some would wonder, then, why more people do not take advantage of all of the above mentioned health opportunities. This appears to be due to several reasons. Fear, lack of knowledge or misinformation regarding medical matters, prejudice, complacency, procrastination, neglect, and the financial status of the individual tend to control people's thinking relative to health matters.

As far as preventative medicine is concerned, there are many concepts to be considered. Primarily, there is the acceptance by the patient. A survey shows that only about five per cent of patients seek out their family physician to seek medical care or advice in preventing disease. People in apparent good health do not seek out their family physician strictly for the purpose of maintaining their "well" state of being.

Many physicians have tried to encourage well patients to have their eyes examined, to have a urine examination, to have tests or x-rays for tuberculosis, to have examinations for heart disease, tests for diabetes, and periodic physical examinations for the detection of disease in the early stages. Who takes advantage of such preventive techniques? Too often, not the patient who is having difficulty in seeing from glaucoma or the worker who does not like to wear protective goggles. Too often, not the man who is coughing, nor the man whose family is known to have diabetes, nor the patient who is overweight or is having symptoms of heart disease or high blood pressure. These people, like so many others, seem to be more afraid of learning something is wrong than they are of preventing serious consequences. Fear of finding out is actually greater than the fear of actually having the disease.

As far as lack of knowledge and proper information to guide people's thinking and prejudice concerning medical and health matters is concerned, efforts are constantly being made by the various public health services, foundations, research medical centers, and by the medical profession to properly inform the public authentically regarding health problems. However, these efforts are being nullified to a considerable extent by the tremendous amount of misinformation given the public through commercial advertising of medical products, treatments, cures, and so forth, via the radio, television, newspapers, and other publications. A survey will show that by this exploitation the American public spends annually for these useless drugs, nostrums, cold remedies, vitamins, and others, enough money for all their medical bills for good medical care.

As for complacency, procrastination, and neglect by the individual relative to health matters, only continued efforts in public health education are needed. There are still large numbers of children and young adults who have not yet had polio shots and other immunizations. Relative to the cost of medical care and the economic status of the individual as a deterrent factor in the acceptance of the opportunities available for proper and adequate medical care, this factor is in reality not true. It depends to a great extent on the importance which the individual puts on what he should spend for the preservation and maintenance of good health. It depends on where he puts the cost on his monthly budget list. Statistics will show that the American public spends more for cigarettes alone than it does for medical care, much more for liquor, and many times more for luxuries and recreation. Today, with the availability of prepayment insurance plans for medical and hospital care, proper budgeting should make it possible for the majority to take advantage of the opportunities for better health.

It would appear, then, that further effort should be made in educating the public of the availability of their health opportunities. The great benefits of preventative medicine should be stressed, and more people pursuaded to accept them.

Evidence exists that a periodic measurement of the health of supposedly well individuals often leads to the discovery of significant, previously unrecognized disease, that such is frequently still asymptomatic, and that, as would be expected, better results are frequently enjoyed when these diseases receive attention in the early stages.

Although health maintenance is primarily the responsibility of the individual, an industrial health program represents management's recognition of its obligation to provide a safe work environment and its opportunity to promote better health among its employes.

Management, by instituting a program of periodical examinations of employes, is attempting

to do its part in preventative medicine and health education. The value of these examinations will depend, of course, upon the scope and extent of the examinations. It will depend, however, primarily upon two things. First, the medical history which the examiner is able to obtain, and secondly, the physical examination. It is therefore important that the employe provide the medical examiner with complete details regarding his past medical history. This, along with the physical examination, many times may prove to be very beneficial to the employe. Conditions needing treatment will be brought to his attention, sometimes in the early stages, where the most good can be done. While some employes may be examined regularly by their own private physician, there may be many other cases in which the physical examination conducted in the industrial medical department may be the only one that he has had for a considerable period of time.

In this manner, management in industry is then playing a significant role in modern medicine in attempting to get more people to take advantage of all the opportunities available for better health.

O. L. McHaffie, M.D.

MEDICAL LEGAL SECTION

Attention is called to a new section on Medical Legal Opinion which appears for the first time in this number of Minnesota Medicine (page 1825). Information of interest in this field will be published each month in the future.

The subject this month is a Syllabus by the Court concerning action taken with regard to a contract with a laymen allowing him to practice the science of healing in violation of Minnesota law.

The January number will present selected quotations from Minnesota laws concerning the practice of medicine, hospitalization, Blue Cross and Blue Shield.

The February number will contain selections from Supreme Court rulings concerning the practice of medicine.

The March number will give quotations from rulings of the American Medical Association and other organized medical groups.

A QUOTATION FROM AN OPINION ON THE MEDICAL PRACTICE ACT

In an opinion handed down by Justice Jaggard of the Supreme Court of Minnesota on December 22, 1905, in the case of the State versus Oredson, the following concise statement defining the object of the Medical Practice Act was made:

"On the contrary, its plain object was to prevent the public wrong of practicing medicine without a license. The act was not enacted for the benefit of any profession or of any school or theory of medicine. It was designed to secure the public in whole and in every part from quacks, humbugs, and charlatans masquerading under the venerable and honorable titles of surgeons, physicians, and doctors, and to protect the public in a just reliance upon the one using these titles as a man of proper education and sufficiently trained in the sciences involved. A just enforcement of that act would tend to prevent the most deplorable swindling of the ignorant poor, who can least afford to pay for the luxury of deception, and who are the most likely to be the dupes of ostensible practitioners, whose competency has not been determined by law, and whose moral deficiencies are evidenced by their false pretenses. Its terms should be construed, so far as reasonably may be, so as to tend to eliminate the suffering of an individual from the misuse of inert drugs when potent ones are needed, and of powerful agencies productive of ill where proper ones might bring relief or effect a cure, so as to avoid many evils of malpractice, and so as to minimize the exposure of the community at large to the spread of avoidable pestilence. The act is at once a statute of frauds and a health ordinance."—(State v. Oredson, Supreme Court of Minnesota, December 22, 1905, 96 Minn. 509, 105 N. W. 188.)

CORRECTION

In the editorial entitled "Digitalis Treatment of Heart Disease," published in the November, 1959, number of Minnesota Medicine, page 1637, the word "rapid" was inadvertently omitted from the seventh sentence in the first paragraph. The sentence should read: "For those patients who do not require *rapid* digitalization, the whole leaf product is still the best."

President's Letter

THROUGH THE LOOKING GLASS

"The time has come," the walrus said, "to speak of many things; of ships and shoes and sealing wax, of cabbages and kings."

"Cabbages and Kings" was the title of an interesting column many years ago in the *St. Paul Pioneer Press,* edited by the late Larry "Ho" Hodgson. This column was replaced by Paul Light and more recently by "Once Over Lightly," edited by the humorous Roy Dunlap.

Now the time has come for me to write my final letter for the President's column for 1959. This has been an arduous but enjoyable task thrust upon your President during the past year. I only hope that you have enjoyed my humble efforts as much as I have enjoyed trying to submit to you something of timely interest.

During the past year, it has been my privilege to attend many meetings and banquets, too many to mention. However, one of the most interesting of all was an "Institution Bus Trip" early in November to the Fergus Falls State Hospital, the Walker (State Sanatorium), and the new Brainerd State School and Hospital.

The trip was sponsored by the Mental Health Policy Committee, of which Dr. Bernard C. Glueck, Jr., is chairman. It was established by law to advise the Commissioner of Public Welfare on all mental health program areas. The plan involves a series of visits to our institutions for the mentally ill, mentally retarded and tuberculous, with the intended purpose of becoming better acquainted with the patients, employes, and volunteers in these institutions, also with their treatment programs.

Those making the trip included Governor Orville Freeman, a group of State Senators and Representatives, members of the press, Morris Hursh, Commissioner of Public Welfare, Dr. Dale Cameron, Medical Director, Department of Public Welfare and his staff, myself and Dr. Bernard Glueck—a total of twenty-six. The trip was made in a comfortable bus loaned by the Cambridge State School and Hospital which was originally donated to our Sandstone State Hospital by the Tenth District American Legion Auxiliary.

We were all convinced that the hospitals are doing a very good job for patients within the limit of their funds. They could use more employes, the employes should be paid more money; but we didn't see any cases of neglect. At Fergus Falls, Dr. William Patterson is doing a wonderful job and has done so for many years, but he needs more professional help. He is aided a great deal by more than seven hundred men and women volunteers from the community who are doing an excellent service particularly in the new geriatrics unit.

At Walker, Dr. Mervyn Williams, the Superintendent, also has his troubles. That hospital is gradually becoming another mental institution. Walker is primarily for the tuberculous, but at present time there are only eighty tuberculous patients in the hospital. More than two hundred are classed as mentally ill, yet there are no psychiatrists on the Walker staff.

The new Brainerd State School and Hospital for the mentally retarded is a magnificent and luxurious institution. There are only eighty-eight patients at Brainerd at the present time, but over five hundred are expected by next summer when the various units are completed. Here the atmosphere is wonderful and particularly supplemented by more than 150 volunteers from the Brainerd area.

In conclusion, it would appear that the next session of the legislature will face a problem financially. There must be a reappraisal of top medical salaries and hospital administration salaries. It may not be more costly either. With the best staff possible and full complements of workers, the number of patients will go down.

Benjamin B. Forster M.D.

President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

"HEALTH" SESSION OF CONGRESS BEGINS JANUARY 4

In Roman mythology, Janus was the member of the diety with two faces in opposite directions capable of observing the past as well as the future. January, the month named in honor of this Roman god, will also mark the beginning of a crucial period in the future history of medical practice in the United States.

The second session of the 86th Congress will convene January 4, 1960. Observers close to the Washington scene predict that many of the items of unfinished business pertaining to health will receive the full treatment when Congress convenes in an election year.

A number of those observations and their possible implications were recently prepared by the Washington office of the AMA in its regular monthly summary of news. Because of the importance of this pending legislation, every physician is urged to acquaint himself with the following facts.

The U. S. Chamber of Commerce and two key Congressmen, all opponents of the so-called Forand bill, recently issued separate warnings that an all-out effort will be made to get the controversial legislation through Congress next year.

In its weekly report to members, the Chamber predicted there will be "a powerful attempt" in the next session of Congress to enact the bill (H.R. 4700) which would increase social security taxes to help pay for the cost of the Federal government providing surgical and hospital care for social security beneficiaries.

The Chamber warned that passage of the legislation would mark "a major break-through into the welfare state." It "probably would lead to a compulsory Federal program providing complete medical care for everyone," the Chamber said.

There would be "no stopping" of such a program once it got started, the report said.

The Chamber called upon communities to find orderly solutions to the problems of the aging. Otherwise, solutions "will surely be imposed from Washington," the report added.

Similar warnings were voiced by Reps. Richard M. Simpson (R., Pa.) and Thomas B. Curtis (R., Mo.), key members of the House Ways and Means Committee where the bill was put on the shelf last session.

Strong Counter Drive Urged

Rep. Curtis urged that the medical profession and other leading opponents make a strong counter-drive in an all-out effort to block passage of the bill next session. Unless there is such action, he said he would have to "regretfully" predict that legislation along the lines of the pending bill probably will be enacted in 1960.

Rep. Simpson said that H.R. 4700, and similar legislation affecting the medical profession, "make it imperative that every doctor keep informed on legislative issues before Congress." He also urged that physicians "become patriotic political forces" by giving "their informed viewpoint" to lawmakers at all levels of government.

Rep. Simpson said it "is important" that opponents of H.R. 4700 develop "appropriate alternatives" to solve the health care needs of the aged.

He promised to continue to cooperate with the medical profession to guard "against the disastrous consequences of compulsory national health insurance."

Keogh-Simpson Revival Expected

House Democratic Leader John McCormack of Massachusetts expressed hope that Congress next year will stamp final approval on another bill of particular interest to physicians. He praised the Keogh-Simpson bill (H.R. 10) as "meritorious legislation" and said it "should be enacted into law next year." The measure, which was passed by the House last spring but left hanging in the Senate Finance Committee, would provide income tax deferrals for self-employed persons setting aside money for private retirement plans.

Five-Point Government Partnership Health Program Proposed

A National Republican Committee on Program and Progress proposed a far-reaching health pro-

gram to be carried out by the Federal government in partnership with states and local governments.

Its goals would include: enlarging the capacity of medical schools so that 3,000 more doctors could be graduated each year, providing more hospital and nursing home beds, and supplementing hospital facilities with clinics, day-care centers and more visiting nurses to care for patients in their own homes.

The progress of medical science would be furthered by continued Federal support for basic medical research. But such Federal support would be given under conditions to encourage maximum non-Federal spending on medical research and to prevent "too great a diversion . . . of doctors required for the equally urgent needs of teaching and medical practice." It was estimated that expenditure of $1 billion a year—equally divided between the Federal Government and non-Federal sources—would be required by 1965.

Other recommendations included: vigorous Federal support of preventive health programs, and expansion and greater flexibility of voluntary health insurance programs.

"A free people and a free medical profession can achieve these goals with the wise support of government, without bureaucratic restrictions or interference with the physician-patient relationship which has made American health services a model for the free world," the Republican Committee stated.

The Committee proposed a five-point "partnership" program: (1) short-term Federal aid for construction of medical school buildings, (2) changes in the present hospital construction program to encourage renovation and repair of outmoded hospitals, (3) Federal guarantees for mortgages to finance construction of private nursing homes on a basis assuring high standards of quality in construction and operation, (4) encouragement of construction of diagnostic and outpatient facilities in rural areas and the building of mental health clinics, and (5) Federal aid to cities "in more effective planning and coordination of health services."

PROBLEMS OF AGED AND AGING AIRED IN SENATE SPEECH

Unless Americans recognize and meet the problems of elderly citizens, the cost to the Nation in years ahead will be "too fantastic to contemplate," according to Senator Pat McNamara (D. Mich.), Chairman of the Senate Subcommittee on Problems of the Aged and Aging.

In a speech to the Senate, McNamara cited the rapidly growing population of elderly persons and said that "if medical progress continues, there is no basic reason why human beings cannot live to the age of 125.

"With this dramatic trend, today's problems of aging will seem like minor ripples as compared with the floods of tidal proportions to come," he said.

His speech was in the nature of a progress report on the work of the Subcommittee since it was created by Senate Resolution in January. Extensive hearings have been held in Washington, and following the adjournment of Congress, the Subcommittee will conduct on-the-spot hearings in cities across the Nation.

Life Expectancy Increases

McNamara said that life expectancy in the United States today is about seventy, compared with forty-eight only a little more than fifty years ago. Another forty years is expected to see life expectancy rise to 82. Today there are more than 16 million persons over sixty-five, while there were only 3 million in 1900.

"If we continue to relegate old people to the sidelines—financially, medically and socially—the financial burden to this country just in terms of institutions for the aging will be too fantastic to contemplate," Senator McNamara said.

"We have made it possible for more people to live into the so-called 'golden years' but without adequate incomes, health care, housing and without a recognized role in the community life of the Nation."

Financial Problems of Aging Cited

Senator McNamara said the primary issue facing the aging today is how to maintain a decent American standard of living on a heavily reduced income.

He pointed out that official estimates show an elderly couple needs at least $2,300 a year to live in an urban center in modest fashion. Yet, he said, the average couple on Social Security receives less than $1,500 a year.

"The income of a large proportion of the 16 million Americans over sixty-five ranges from

mere subsistence to desperation and despair," he said.

"Today, benefits from Social Security are apparently not intended to cover most of the living expenses of retired men and women. And we have only begun, in some areas of employment, to create adequate private pension arrangements."

Alternatives Must Be Explored

"In one way or another, a price will have to be paid to meet this growing problem, and both the public and private sectors of America must begin now to explore the alternatives open to us."

Senator McNamara said the problem of health in later years also was a matter of extreme importance and noted that one committee witness had described it as "just as much a public health problem as Strontium 90 in milk or polio in children."

According to Senator McNamara five major points emerged from discussion of the health needs of the elderly.

First: Medical care needs to be reorganized so as to prevent deterioration rather than to merely repair damage. *Second:* Miracles have been wrought in so many cases in the rehabilitation of stroke victims, heart patients, and other sufferers of crippling diseases that an investment in rehabilitation will pay off many times over, not only in dollars, but in human welfare. *Third:* Aged persons in this country require about two and one-half times as much hospital care as the younger age groups. *Fourth:* The large majority of older people in this country do not have adequate hospital and surgical insurance, although in recent years there has been an increase in the number who purchase some kind of voluntary health insurance. Too much of this is inadequate as to benefits, as well as too expensive. *Fifth:* The biggest problem in the medical field for the elderly is the financing of medical care out of a reduced and often merely subsistence income. The subcommittee was urged to study carefully the proposed solutions in this critical field of financing medical costs.

"Over the past decade, there has been a slow but steadily growing recognition of the aging challenge," noted Senator McNamara.

"We hope that the work of this Subcommittee will lay the foundations for a systematic consideration by the Senate of the needs of our older citizens and the contributions they can continue to make to the Nation.

"There is no panacea for these problems, but we do intend to deal with the human values and the proper public policies designed to add life to years, not merely years to life."

HOSPITAL STAYS SHOW POST-WAR DECLINE

Seven out of every ten persons admitted to hospitals stay seven days or less, according to the Health Insurance Institute.

Some 88 per cent of all admissions stay fourteen days or less and 96 per cent stay thirty days or less, the Institute added in its report on a U. S. National Health Survey of hospitalization in the nation over a twelve-month period.

Several studies have indicated that the average length of hospital stay per patient has declined considerably in the post-war years. Programs of all health insurance organizations have been expanded to meet the needs of modern hospital services.

A recent survey of 188 insurance companies disclosed that all provided policies with benefits for more than thirty days of hospitalization, and that 174 companies had policies with benefits for ninety days or more.

More than 123 million Americans had hospital expense insurance at the end of 1958. Insurance companies, Blue Cross, and independent health care plans paid benefits of $2.6 billion in 1958 for hospital care alone, out of a total of $4.7 billion in health insurance benefits.

Women Lead in Hospital Admissions

The National Health Survey revealed that women were hospitalized more frequently than men but stayed for a shorter period of time. Women were hospitalized at a rate of 123 per 1,000 to 74 per 1,000 among men, but stayed about seven days on the average to eleven days among men.

The higher rate of admission among women was attributed generally to maternity which probably also played a significant part in the surprising finding that the highest hospitalization rate by age group came in the fifteen to twenty-four bracket where 137 out of every 1,000 experienced a hospitalization episode. The lowest rate was among children under fifteen where fifty-three out of every 1,000 were hospitalized.

Midwest Tops Hospitalization Rate

By region of the United States, the highest hospitalization rate was in the Midwest, where 105 of every 1,000 persons entered the hospital during the year. The West had a rate of 100, the Northeast followed with ninety-seven, and the South had the lowest, ninety-five.

Of all admissions to the hospital during the year of the study, six out of ten were surgically treated and four of ten were not surgically treated. Surgical patients stayed, on the average, 7.5 days while non-surgical patients stayed 10.3 days.

The study showed that ninety-nine out of every 1,000 persons in the United States were hospitalized during the year, and that they stayed in the hospital an average of 8.6 days.

HOSPITAL COSTS UP

According to the American Hospital Association, the average cost per patient day in the nation's non-federal short-term hospitals has risen steadily in the post-war years. Below is the average cost by year:

Year	*Average Cost Per Patient Day*
1949	$14.33
1950	15.62
1951	16.77
1952	18.35
1953	19.95
1954	21.76
1955	23.12
1956	24.15
1957	26.02
1958	28.17

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

HENNEPIN COUNTY MAN GIVEN ONE-YEAR PROBATIONARY TERM FOR REPRESENTING HIMSELF AS DOCTOR

On November 2, 1959, Robert P. Selisky, 35, 5260 Hampshire Ave. N., Crystal, Minnesota, was sentenced by the Hon. John A. Weeks, Judge of Hennepin County District Court, to a term of one year in the Minneapolis Workhouse pursuant to the defendant's plea of guilty, entered on September 30, 1959, to an information charging him with violating the basic science law by attaching the word "doctor" to his name with the design of indicating that he was engaged in the practice of healing. However, after sentencing Selisky the Court stayed the execution of the sentence and placed him on probation for a period of one year. When questioned by the Court prior to being sentenced, Selisky stated that he is a high school graduate and has completed three years of college. He added that he is presently employed by a Minneapolis musical records firm. After the questioning of the defendent was completed, his attorney made a plea for leniency on the grounds that Selisky is not addicted to dexedrine but only used it as a "crutch" to enable him to meet some emotional crisis such as financial trouble or marital difficulties.

The defendant was arrested on August 30, 1959, by officers of the St. Louis Park Police Department, after he had telephoned the Mike Zoss Drugs, 8024 Minnetonka Blvd., saying that he was Dr. Norris and ordering 100 dexedrine tablets for an alleged patient. Because neither the name of the patient nor the name of the doctor could be verified by the pharmacist the authorities were contacted which resulted in Selisky's arrest after he arrived at the drug store and paid for the tablets. In a written statement taken from the defendant subsequent to his apprehension he admitted that he had previously been arrested in Minneapolis for attempting to purchase drugs in a similar manner. When asked his reason for wanting to obtain dexedrine tablets Selisky replied that he had been addicted to these pills from 1942 to 1945 and that he has been endeavoring to get rid of the habit since that time. When the Minnesota State Board of Medical Examiners was contacted in reference to the matter, a representative of the Board signed a criminal complaint, issued by the Hennepin County Attorney's office, charging Selisky with violating the basic science law, which is a gross misdemeanor.

The defendant has two prior convictions, both being in the Municipal Court of the City of Minneapolis. On September 1, 1954, Selisky was held for police officers at the point of a gun by a Minneapolis man who claimed that the suspect had knocked down his porch railing. Although Selisky was incoherent and acted as though he had been drinking, no odor of alcohol could be detected from his breath and he later admitted to the police that he had been taking seconal and benzedrine. On the following day the defendant was convicted by the Court of the offense of disorderly conduct whereupon he was sentenced to sixty days in the Minneapolis Workhouse, the sentence being stayed and the defendant placed on probation for one year. However, on September 18, 1954, Selisky was again arrested, his probation was revoked and he was committed to the workhouse. On August 26, 1956, Selisky was arrested on a charge of violating the City Drug Ordinance in Minneapolis. The defendant was convicted of that offense and Judge Lindsay G. Arthur sentenced him to a one-year term in the workhouse but stayed the execution of the sentence for the same period of time. Selisky holds no license to practice any form of healing in the State of Minnesota and has not taken training in medicine.

The Art of Medicine

PR

Carl H. Woyke, B.A.
Editor

HIGH WCCO LISTENERSHIP CONTINUES

"Doctor's House Call" mail response to the five-minute radio program featuring Dr. James Rogers Fox continues high.

The same is true for "Your Health," heard each Sunday morning at 8:05 a.m. on WCCO. This program features a discussion of timely health topics between Doctor Fox and Maynard Speece.

Recently offered to "Your Health" listeners were "Questions and Answers on Arthritis" by the Arthritis and Rheumatism Foundation, and "Teaching Johnny To Swim" published by the American Red Cross. In each instance mail requests for individual listeners topped the one thousand mark. Requests for these materials were processed by the staff of the Minnesota State Medical Association.

MOVIE TAGS MEDICAL ASSISTANT AS "DOCTOR'S PR AMBASSADOR"

The key role played by the physician's medical assistant in creating good public relations is emphasized in a new film now available for showings to medical societies and medical assistants groups.

Entitled "First Contact," the twenty-six minute dramatic color film shows the mistakes a new office assistant can make unless she is properly trained for her job and points out that medical assistants groups provide opportunities for increasing on-the-job efficiency.

Dr. F. J. L. Blasingame, Executive Vice President of the American Medical Association, who appears in the film, says the medical assistant is a valuable ally in providing better patient care. Says Doctor Blasingame:

"The medical assistant is the doctor's public relations ambassador—often she has first contact with the patient. Her understanding of good doctor-patient relations and her practice of the techniques that create good will are manifold in their value to her physician and the medical profession.

"The professional medical assistant can make it possible for the doctor to concentrate his time on the scientific side of his practice."

In the film Doctor Blasingame comments on the growth of a new national organization, the American Association of Medical Assistants, dedicated to educational improvement and medical profession cooperation. The AMA passed a resolution commending the aims and objectives of the AAMA in December, 1956.

"First Contact" was premiered before five hundred members of the American Association of Medical Assistants holding their third national convention in Philadelphia, October 16. Prints of the 16 mm. film are available to medical societies for showings through AMA's Department of Medical Motion Pictures and Television and to medical assistants groups through the headquarters of the American Association of Medical Assistants in Chicago at 510 North Dearborn Street.

The film, produced for AAMA in cooperation with AMA as a special service of Wyeth Laboratories, also can be obtained by writing directly to the Wyeth Film Library, Box 8299, Philadelphia 1, Pennsylvania.

HAVE YOU HEARD THE NEW "DOCTOR, TELL ME"?

Public health education in Minnesota assumed a new dimension when the new five-minute "Doctor, Tell Me" radio series sponsored by the Minnesota State Medical Association was inaugurated during the week of October 25.

Nineteen radio stations throughout the state of Minnesota have adopted the new format which features Doctor James Rogers Fox answering questions as asked by Miss Audrey June Booth. A number of stations have already expressed their approval of the new series.

Eight stations are continuing to schedule the traditional fifteen-minute program series heard once each week. Many of the stations participating in this project have scheduled "Doctor, Tell Me" for the fourth consecutive year. Because the demands upon the broadcasting industry for public service time are many, those stations who continue to schedule "Doctor, Tell Me" are indeed worthy of a word or note of thanks.

Physicians and county medical societies are urged to extend their appreciation to radio stations within their area who schedule "Doctor, Tell Me." The future of "Doctor, Tell Me" could depend upon your simple thank you.

Stations which have scheduled the new Monday through Friday "Doctor, Tell Me" series are:

Alexandria	KXRA	10:50 a.m. Monday through Friday
Benson	KBMO	Right before signoff news at sunset
Brainerd	KLIZ	2:55 p.m. Monday through Friday
Crookston	KROX	4:05 p.m. Monday through Friday
Detroit Lakes	KDLM	2:25 p.m. Monday through Friday
Duluth	KDAL	6:30 p.m. Monday through Friday
Ely	WELY	6:05 p.m. Monday through Friday
Fairmont	KSUM	
Faribault	KDHL	6:55 p.m. Monday through Friday
Litchfield	KLFD	9:25 a.m. Monday through Friday
Little Falls	KLTF	9:55 a.m. Monday through Friday
Mankato	KYSM	6:05 p.m. Monday through Friday
Marshall	KMHL	10:10 a.m. Monday through Friday
New Ulm	KNUJ	10:35 a.m. Monday through Friday
Pine City	WCMP	3:02 p.m. Monday through Friday
Red Wing	KCUE	9:15 a.m. Monday through Friday
Redwood Falls	KLGR	6:10 p.m. Monday through Friday
St. Cloud	KFAM	3:30 p.m. Monday through Friday
Windom	KDOM	4:30 p.m. Monday through Friday

These stations have scheduled the fifteen-minute "Doctor, Tell Me" program once each week:

Albert Lea	KATE	7:00 p.m. Wednesday
Eveleth	WEVE	5:15 p.m. Sunday
Grand Rapids	KOZY	5:15 p.m. Saturday
Pipestone	KLOH	4:30 p.m. Sunday
Thief River Falls	KTRF	7:00 p.m. Sunday
Willmar	KWLM	4:45 p.m. Sunday
Winona	KWNO	
Worthington	KWOA	4:30 p.m. Sunday

Medical Legal Opinion

● *The purpose of this section entitled Medical Legal Opinion is to publish news of recent litigation concerning medical practice as well as to cite past actions and opinions of the Court in medical legal matters as a means of refreshing our knowledge of such procedures.*

GRANGER v. ADSON et al, No. 29476,
Supreme Court of Minnesota, November 3, 1933

Syllabus by the Court

1. The plaintiff, a layman, in conducting a "health audit" for a fee for which he furnished his subscribers with the results of urinalyses and blood pressure tests, and either himself advised, or passed on to the subscriber advice from the pathologist who made the urinalyses, as to whether the results showed a normal or abnormal state of health and whether the subscriber should see a physician, in some cases advising as to diet, exercise, and habits, was practicing medicine unlawfully in violation of section 5717, Mason's Minn. St. 1927.

2. In so doing he is practicing the science of healing in violation of Mason Minn. St. 1927, section 5705-1, which defines the science as including the diagnosis or analysis of the condition of human health.

3. Plaintiff's contract with his pathologist was illegal and in violation of statute and the public policy of the state.

Appeal from District Court, Hennepin County; Frank E. Reed, Judge.

Action by John Granger against A. W. Adson and others, individually and as members of the State Board of Medical Examiners. From an order sustaining a demurrer to the complaint, plaintiff appeals.

Affirmed.

Thompson, Hessian & Fletcher and Carleton F. Boeke, all of Minneapolis, for appellant.

Harry H. Peterson, Atty. Gen., and F. Manley Brist, Sp. Asst. Atty. Gen., for respondents.

LORING, Justice.

This is an appeal from an order sustaining a demurrer to plaintiff's complaint in an action to enjoin the defendants from interfering with a contract which plaintiff had with a Dr. Grave. The complaint alleges that plaintiff, who is a layman, conducts what is termed a "health audit" in the city of Minneapolis. For a fee of $10 per year, he contracts with his "subscribers" to furnish four urinalyses and a blood pressure test each year. The urine samples are sent in by mail, as a general rule, and plaintiff then turns them over to Dr. Grave, a pathologist with whom he has a contract to furnish the results of the analyses to him. According to the plaintiff, if an analysis shows serious abnormal condition he advises his subscriber to consult a competent physician; but if the abnormality is slight he advises him in regard to proper diet, habits, and exercise, should the report of Dr. Grave advise such. Plaintiff's complaint specifically denies that he is practicing medicine or that the conduct of a health audit business consists of the practice of medicine. The defendants, who comprise the state board of medical examiners, advised Dr. Grave that plaintiff was engaged in the practice of medicine contrary to the laws of the state of Minnesota, and at once to desist from making urinalyses for the plaintiff on the ground that it was illegal for Dr. Grave to furnish plaintiff with the results thereof for the benefit of the plaintiff's subscribers. He accordingly desisted, and this action followed.

1. It is the contention of respondents that Granger was engaged in the practice of medicine contrary to the provisions of section 5717, Mason's Minn. St. 1927, and that he was engaged in the practice of healing as defined by the basic science law, Mason Minn. St. 1927, section 5705-1. It is alleged in the complaint:

> "It is true that in some cases where an abnormal condition is not indicated but certain minor disturbances appear, plaintiff, after consultation with the pathologist, and repeating the advice given him by the pathologist, advises the subscriber as to certain improved habits of either diet, exercise, or living. Under no circumstances does plaintiff ever advise the taking of any medicine or any treatment, but suggests to all subscribers whose reports are repeatedly abnormal that they should consult their own physician. *** That a urine analysis and blood pressure test furnish a convenient, reliable and accurate indication of the state of a person's health."

In our opinion, advising the subscriber for a fee as to certain improved habits of diet, exercise, or living, although not accompanied by any medical prescription or treatment, is a violation of section 5717. State v. Edmunds, 127 Iowa, 333, 101 N.W. 431; Heintze v. State Board, 107 N.J. Law, 420, 153 A. 253. Diet, exercise, and mode of living are agencies for the relief of disease; indeed, they are the only known relief or treatment of some diseases. It further appears that the urinalyses and blood pressure tests are important as indicating the condition of a patient's health, and when an abnormal condition is indicated the opinion of the pathologist is passed on by the plaintiff to his subscriber.

In his complaint, the plaintiff sets out some twenty-two items whose presence, absence, or quantity must be considered in determining the result of the analysis. The analysis and the test form a basis for a diagnosis. Necessarily, the question of whether the analysis results in indications showing normal or abnormal conditions is a matter of professional medical opinion. Deductions must be drawn from the result of the analyses, and these deductions are of value only when made by a medical man. It cannot be otherwise. The pathologist is, of course, a licensed physician, and in this case is said to be an expert in his line. Obviously, if he were in direct contact with the subscriber as a patient, he would be practicing medicine in doing exactly what the plaintiff hired him to do. The results of his work the plaintiff passes on to his subscribers. It is settled law in this state that:

"The science of diagnosing human diseases and human ailments has come to be a distinct branch or department of the medical profession; the diagnostician limiting his efforts to a discovery of the disease or ailment from which a patient may be suffering, its character and location, leaving the treatment thereof to some other physician or surgeon. This is a matter of common knowledge. And it requires no discussion or argument to demonstrate that the physician who thus applies his learning and energies is performing a highly important duty of the profession, and is engaged in the practice thereof, though he prescribes no drug and administers no specific treatment." State v. Rolph, 140 Minn. 190, 194, 167 N.W. 553, 554, L.R.A., 1918D, 1096.

If Dr. Grave was practicing medicine in what he did and in determining for the plaintiff whether the condition of the urine was normal or abnormal, then, in our opinion, the plaintiff was practicing medicine when he passed on to his subscribers the result of the analyses and the advice of the pathologist. It was as much practicing medicine for the plaintiff to engage Dr. Grave to do this for him as it would have been if he had attempted himself to perform these analyses, as he in fact did in the case of the blood pressure tests. To pass on to his subscribers advice as to whether or not the tests indicated a normal or abnormal condition, and whether or not the subscriber should consult his physician or be content with the advice which plaintiff might give in regard to diet, exercise, or mode of living, was practicing medicine. In Re Disbarment of Otterness, 181 Minn. 254, 232 N.W. 318, 73 A.L.R. 1319, we said that a corporation or layman could not indirectly practice law by hiring a licensed attorney to practice law for others for the benefit or profit of such hirer. We are just as firmly convinced that it is improper and contrary to statute and public policy for a corporation or layman to practice medicine in the same way. The obligation of Dr. Grave under his contract was to plaintiff, not to the subscribers. Plaintiff might engage anyone to perform these analyses. What the law intends is that the patient shall be the patient of the licensed physician, not of a corporation or layman. The obligations and duties of the physician demand no less. There is no place for a middleman.

We see nothing in this to prevent life insurance companies from furnishing gratuitous examinations to their policy-holders. They charge no fee, and make the examination in furtherance of reduction of hazard. Neither do we see any objection to the employment by physicians of technicians and other experts, the results of whose work the physicians interpret as a help to diagnosis.

2. Mason Minn. St. 1927, section 5705-1, defines the practice of healing as including the diagnosis or analysis of the condition of human health. As above stated, the plaintiff has alleged in his complaint that the analyses and tests which he furnishes his subscribers constitute a convenient, reliable, and accurate indication of the state of a person's health. It is so obvious that what the plaintiff does in this regard is practicing healing within the provisions of the statute quoted that it is unnecessary further to discuss that subject.

3. It follows that the contract between the plaintiff and Dr. Grave was in furtherance of plaintiff's violation of these statutes. It was illegal, against public policy, and void, and no injunction will lie to prevent interference therewith.

The order is affirmed.

Minnesota Blue Shield—Blue Cross

Minnesota Blue Shield has provided benefits for the delivery of over 150,000 new Minnesotans. The number of obstetrical claims paid by the Plan from its beginning in 1947 through September, 1959, totals 158,646.

Obstetrical benefits provided by Blue Shield as of September 30, 1959 total over $9,629,000. This figure is equal to an average obstetrical payment of slightly more than $60. For approximately the first five years of operation the Plan A obstetrical allowance was only $50. During 1953 this benefit was increased to $60 and in 1954 Plan B was made available with an obstetrical allowance of $100. The average obstetrical payment has increased steadily as the number of Plan B family contracts has increased.

The number of obstetrical services paid by Blue Shield as of September 30, 1959 is equal to approximately 18 per cent of the total number of participant subscribers enrolled as of the same date, 871,795.

During the first nine months of this year Blue Shield paid $1,153,426 for 17,174 obstetrical claims, an average of over $67 per claim.

Ten months have passed since Minnesota Blue Cross started notifying members as to the intent of the Blue Cross contract as related to routine physical examinations or diagnostic studies. To date, all non-group members have been notified as to the exclusion and all group members will be notified by December 1, 1959.

Statistics to date indicate that clarification of the intent of Blue Cross benefits as related to diagnostic and physical examinations with doctors and members has apparently been successful in curbing a certain amount of needless use of Blue Cross contracts. This in turn has resulted in the reduction of the number of persons hospitalized per 1,000 Blue Cross contracts in effect.

A significant stablization in the number of services provided occurred in the areas of medical care. This is the category in which Blue Cross provides diagnostic and physical examinations of members hospitalized for conditions of illness or injury on an in-patient basis.

Richard T. Crist, president of Minnesota Blue Cross, said, "Even though the percentage of decrease might not appear to be too great, such a favorable trend indicates that we are going in the right direction of our objective . . . that of attempting to stabilize rates for Minnesota Blue Cross members."

Crist further explained that success in curbing needless use of Blue Cross benefits was largely a result of cooperation on the part of doctors and Minnesota Blue Cross members. "Several thousand personal phone calls were made to doctors during the first nine months of 1959, at which time we requested clarification as to the nature of the diagnosis and hospitalization," Crist said. "In almost 100 per cent of the cases, the doctors were extremely helpful."

Crist said that "Blue Cross owes a 'thank you' to the members and doctors of Minnesota for cooperating in what apparently has been a successful project . . . a project though apparently successful did not result in denying Blue Cross hospital benefits to those who were sick and needed care."

Crist also pointed out that reserves for contingencies and future hospital care of members now exceed four million dollars and operating expense for the first nine months of 1959, hit an all time low of 4.6 per cent of subscriber income.

HEART ASSOCIATION BEGINS DIRECT PUBLICATION OF JOURNALS

Direct publication by the American Heart Association of its two scientific journals, *Circulation* and *Circulation Research*, will begin with the January, 1960, issues. The journals were previously published by a private publishing firm.

Under the new arrangement, *Circulation* will regularly feature symposia on a broad range of subjects relating to cardiovascular diseases. The first symposium, consisting of various papers on the subject of congestive heart failure, will be carried in the January, February and March, 1960, issues of the journal.

As in the past, other sections of *Circulation* will be devoted to original articles and practical reviews by leading cardiologists, abstracts of significant international contributions to cardiologic problems, book reviews and news notices of particular interest to clinicians and cardiologists. Issued monthly by the Association since 1950, *Circulation* is edited by Dr. Herrman L. Blumgart of Boston, Professor of Medicine, Harvard University.

Additional symposia for publication in forthcoming issues are planned on coronary heart disease, surgery in acquired valvular disease, angina pectoris, myocardial infarction, degenerative cerebral vascular disease, cardiac surgery, regulation of the cardiovascular system in health and disease, and recent developments in supplementary diagnostic techniques.

Circulation Research is the only publication devoted exclusively to reports on fundamental research studies as they apply to the broad field of cardiovascular medicine and surgery. Inaugurated by the Association in 1953, the journal is issued bimonthly and edited by Dr. Carl F. Schmidt of Philadelphia, Professor of Pharmacology, University of Pennsylvania Medical School.

Committee Action

COMMITTEE ON PULMONARY DISEASES

Minutes of Meeting
June, 1959

Dr. John F. Briggs, in opening the meeting, announced the subject for discussion as "Pulmonary Function Studies," to be presented by Dr. Robert Rossing and Dr. Ward Fowler.

Dr. Rossing defined the scope of the evening's discussion. He and Dr. Fowler had decided to cover the subject in two meetings, with the first meeting to include the basic physiology of pulmonary function tests and the testing technique. The second meeting will include more direct clinical application and interpretation of these tests.

Dr. Rossing showed several slides and gave credit to the book entitled "The Lung" by Julius H. Comroe, Jr., M.D., et al, which he had used extensively for slide material. He highly recommended this book to the committee members interested in a study of pulmonary physiology and its application.

The first slides outlined the four primary lung volumes as (1) tidal volume; (2) inspiratory reserve volume; (3) expiratory reserve volume; and (4) residual volume. He discussed the various terms denoting the four capacities of the lung, the best known of which is the "vital capacity"—the total amount of air that can be expelled from the lungs by forceful effort following maximal inspiration. He defined the "functional residual capacity" as the amount of air remaining in the lung at the end of an expiration. Even at the end of maximal expiration, Dr. Rossing explained, a certain amount of air which is in the lung cannot be expelled. Lung volumes can be measured by a spirometer and some can be measured by direct methods. However, the measurement of functional residual capacity usually is not incorporated as part of a routine clinical pulmonary function evaluation.

Dr. Rossing also discussed "dead space"—the amount of air moved with each breath which does not come into effective contact with alveoli and pulmonary capillaries; it is wasted ventilation. Types of respiratory dead space according to one of the slides shown by Dr. Rossing, are found in: conducting airways—"anatomic" dead space; alveoli with no blood and ventilation in excess of blood flow—"physiologic" dead space.

Dead space was originally measured in cadavers. The measurement of anatomic dead space in a living individual is usually done with a nitrogen meter. The patient takes a single breath of oxygen. Then he exhales into a nitrogen meter. The volume of air is measured up to the point at which nitrogen first appears. Measurement of physiologic dead space depends on comparing the carbon dioxide content of expired air with the carbon dioxide content of alveolar air. Dead space, Dr. Rossing went on, does have some real clinical significance. Sometimes patients with marked respiratory insufficiency are unable to take deep breaths. At times, tracheotomy is advisable to reduce the dead space.

Dr. Rossing then brought up the question, "What does the lung do?" Lung function may be broken down, for terms of discussion, into four activities:

1. *Ventilation*—The actual transport of air into the lungs.
2. *Distribution*—The partition of air so that each segment (and, ideally, each alveolus) obtains an equitable share of ventilation.
3. *Diffusion*—The transport of oxygen and carbon dioxide across the alveolo-capillary membrane from alveolus to capillary blood.
4. *Circulation*—The process of supplying each pulmonary capillary with an equitable share of blood flow.

Dr. Rossing said that pulmonary ventilation involves work, and an elaborate set of muscles has been provided us. The work of breathing that must be done can be defined as force times distance, or as pressure times volume. His next slide, illustrating the elastic work done in the lung, showed the difference in force needed to move a block (which was attached to a wall by a spring) when the block is resting on a frictionless surface, and when the block is resting on a rough surface. Additional work is needed to overcome friction. Similarly, there is friction in the lungs—primarily of air as it passes through the airways. There is also tissue friction within the lung itself. The two types of work have been described by the physiologist as pulmonary compliance and pulmonary resistance.

Measurement can be made of the elastic properties of the lung. It is defined as the increase in volume which results from each unit change in pressure. Measuring the volume of air which enters the lung with each unit of pressure measures the lung's compliance.

A patient with a fixed maximum respiratory

force, as his compliance decreases, will be able to effect less of a volume change than a patient with a more compliant lung. By applying this same force, as his resistance increases, he will be able to move air more slowly. Therefore, we measure the amount of air which the patient can move with a single breath and the rate at which he can do it.

A patient with pulmonary fibrosis, for instance, has reduced pulmonary compliance and can move a good deal of air less than the average patient. The tests which are available to measure specific resistances to breathing are useful in recognizing conditions in which there is a reduction in pulmonary compliance.

One of the succeeding slides showed spirograms of normal patients and patients with pulmonary fibrosis, asthma, and emphysema. The patient with asthma took ten seconds to accomplish what the normal patient could do in three or four seconds. By measuring the time component, the doctor knows how rapidly the patient can move air. It is also important, Dr. Rossing added, to measure total vital capacity.

Tribute was paid to Dr. Myers and the charts he developed which are still being used today. Dr. Myers was one of the first to call attention to the importance of measurement.

The measurement of time to be used. Dr. Rossing went on to say, can be one second, and the volume of air expired in the one second can be expressed as a ratio to the patient's total vital capacity. Dr. Fowler has recently stressed the measurement of the mid-expiratory flow rate. Another measurement used is the early flow rate, in which an attempt is made to estimate peak flow rate right at the beginning of expiration.

The important thing, as brought out by Dr. Rossing, is that some sort of time estimate be made as to how air comes out of the lung. This type of measurement enables the doctor to classify difficulties as restrictive and obstructive. Restrictive difficulties are those in which the total vital capacity is primarily affected. This can be related to a reduced compliance. Obstructive difficulties are those connected with asthma and emphysema, where the essential difficulty is the patient's inability to force air through the obstructed airways.

After study of total vital capacity, Dr. Rossing said, people begin to ask questions about the relative ventilation of the two lungs. It becomes especially important when the patient is being considered for surgery, in which one lung or a portion thereof must be removed. This gives rise to bronchospirometry.

Dr. Sumner S. Cohen, being called on for a discussion of the technical factors involved in bronchospirometry, stated that it is developed as a means of determining the relative part each lung is contributing to the total breathing capacity. This is helpful under many conditions particularly with the recent extensive development of thoracic surgery. Dr. Cohen stated that sometimes it is essential to know the relative part contributed by each lung—in cases of bilateral disease or in patients in the older age group.

Bronchospirometry is done by introducing a double barreled catheter, similar to bronchoscopic tubes. It can be done with the patient in an upright or supine position. Dr. Cohen said that the tube is introduced with the patient in an upright position. Two balloons are inflated—all the air from the left side goes through one part of the tube. That is then connected with a double spirometer. The resistance factor has been removed, as far as possible. The resulting graph can subsequently be interpreted. Dr. Cohen emphasized that this is primarily to give the relative function of the two sides and is not a good method of getting total actual values. It is done under abnormal conditions and does not represent what the patient can normally do. At present, he added, Carlen's tube is used because resistance is not so great.

Dr. Cohen showed a slide illustrating the type of tracing obtained by bronchospirometry, indicating measurement of air flow of the two lungs in relation to each other. The slide was done on a patient who was being checked because of her requirement for bilateral resection. On initial testing, she had 60 on the right and 40 on the left. It is usually true, Dr. Cohen indicated, that the right is a little better than the left.

Dr. Cohen stated that during his training, it was believed that the patient should lie on the side to reduce the movement of one lung. However, it has now been shown that ventilation is improved on the side on which the patient is lying.

Dr. Ward Fowler, in presenting his part of the program, discussed the oxygen hemoglobin dissociation curve and stated that the principal function of the lung is to exchange oxygen and carbon dioxide. The over-all rates at which the lungs do this are not often issues, because the problem is the supply of oxygen. If oxygen is not supplied to the brain, a person is dead in five minutes. Under ordinary circumstances, as long as people are alive and functioning, the over-all supply of oxygen is adequate. The problem in evaluating pulmonary efficiency is the efficiency with which this process is accomplished—the level at which these gases are maintained.

Dr. Fowler went on to say that the end result of taking in oxygen is getting oxygen into the blood for transport to the tissues. He then discussed hypoxemia—the lack of oxygen in the blood. Since blood is similar in all arteries, any blood can be examined to see what the levels of oxygen are. The usual clinical evaluation of hypoxemia is by the observation of cyanosis. Nor-

mally, it is necessary for most observers that saturation be down from the normal 95 per cent to 80 some per cent before cyanosis can be detected visibly. Visible cyanosis is a very advanced problem basically in terms of how efficient the lung is. There is a more efficient procedure to find out how well the lungs are exchanging oxygen. This becomes technically difficult, however; there is no procedure simple enough to be done in office practice. Measuring tension, Dr. Fowler pointed out, is quite difficult. Another approach is the measurement of oxygen saturation. This must be done very accurately. Saturation is the content of oxygen over the capacity of the hemoglobin. One hundred per cent saturation means that the hemoglobin contains all that it possibly can contain. This requires arterial blood, and the arterial puncture, according to Dr. Fowler, is not particularly difficult. Blood can then be analyzed for oxygen, and this process is within the realm of any laboratory.

Other methods used to determine oxygen saturation are manometric or photometric techniques—such as the spectrophotometric. These are becoming increasingly available in hospital laboratories. All require direct samples of blood from an artery. There are also bloodless methods —one of which works on the principle of reflected light.

Dr. Fowler referred to the ear-oximeter developed by Dr. Wood, which has the advantage of continuous readings. However, the initial cost is high and the technical maintenance almost prohibitive, unless it is needed eight hours a day every day.

Another problem discussed by Dr. Fowler was the measurement of the level of carbon dioxide. There is no simple, easy way of going about this in terms of measurement, he stated. There are bloodless methods which Dr. Fowler believes will be the methods of the future. If one has the proper means of analyzing how much carbon dioxide is in the expired air, it is easy, he said. There are machines on the market—such as the infra red analyzer. This machine is not much more difficult to operate today than an electrocardiograph. It will run constantly for several years before needing maintenance. However, Dr. Fowler added, it is fairly expensive. When used on a patient with emphysema, unfortunately, the particular sample of air which is obtained when the patient breaths out, is not the sample the doctor wants. The sample is from the overventilated part of the lung. Serious mistakes can be made if this is not recognized.

A procedure which a number of laboratories all over the world are working on is adapting the infra red analyzer to the old procedure of rebreathing.

The usual method of measuring carbon dioxide is by plasma combining power, which was first introduced by Dr. Van Slyke. This method is still used by the medical profession, although abandoned by Dr. Van Slyke. One is able still to get a fairly good answer without serious technical difficulties.

When the carbon dioxide combining power is normal, Dr. Fowler added, there is neither acidosis nor alkalosis. With experience and with understanding, the carbon dioxide combining power can be very useful, and the doctor can determine a great deal about acid-base balance. He believes the bloodless methods will come into wide clinical use.

In summarizing his discussion, Dr. Fowler stated that as yet nothing basically new in the field has appeared since recognition of CO_2 combining power. However, we are now moving quite rapidly. There are some methodologies suitable now for large institutions with many patients. Many of Dr. Fowler's clinical colleagues are ordering these tests on a routine basis for their patients. He added that Dr. Myers no doubt had a very good picture of the whole area of pulmonary function studies. Dr. Fowler believes that the lungs are as important as the kidneys or any other part of the body. In the last ten years, there has been a revival of interest in the lung here and all over the world. He attributes this increased attention to better chest methods in many areas—better thoracic surgery, for example. It becomes necessary for the doctor to make decisions involving lung surgery. There has been an increasing interest in the diseases of the lung as people get older. He added that it is regrettable that no one in the United States has an accurate record of the incidence of emphysema. This is not a rare disease. Dr. Fowler likened it to tuberculosis as it was regarded fifteen to twenty years ago. Although the etiology of pulmonary emphysema is not known, this does not mean, Dr. Fowler said in conclusion, that one must cease trying to identify it early and attempting to use the therapeutic measures which are available.

Dr. Briggs called on *Dr. Baldry* for comments on the status of chronic bronchitis in England. In Dr. Baldry's opinion, there is a difference in definition of that disease between our two countries. He is sure there is a lot of chronic bronchitis in America, even if it is not known by that term. He went on to say that he believes the greatest thing they have at the moment to stop chronic bronchitis in Great Britain is to stop people from smoking. However, he added, that cannot be the whole answer. There are atmospheric problems in England—such as the humidity and pollution of the air. They are working on the problem of a cleaner atmosphere.

Dr. Briggs then called on *Dr. J. A. Myers* for comments on the early research in pulmonary diseases. Dr. Myers referred to a critique written

by John Hutchins of England in 1847. He also discussed the contribution of Ernest Graham during World War II. Many soldiers were dying from flu pneumonia, and Dr. Graham was appointed Empyema Commission Chairman. Under his direction, open surgery on the chest was restricted to those patients whose vital capacity was at a satisfactory level.

Dr. F. F. Callahan mentioned his experiences during World War I. There was a tremendous amount of empyema, and it was standard procedure at that time that if fluid was found in the chest, the physician would operate.

Dr. Ralph West was called upon to comment on the subject from the veterinary standpoint. He said there was little on which he could report since the new procedures for studying pulmonary functions had not been applied in his field. Dr. Fowler questioned Dr. West about the relation of veterinary medicine to the problem of pulmonary emphysema in human beings. Dr. Fowler mentioned a research conference on pulmonary emphysema held in Colorado last summer. A "heaving" horse was to appear on the program, but unfortunately it expired. In that connection, Dr. West mentioned the case of southern horses brought into the midwest regions where they develop heaves, which is definitely a type of pulmonary emphysema.

Dr. Baldry commented that in many people with emphysema *per se,* unless they have had pulmonary chronic bronchitis, there does seem to be a constitutional factor involved.

Dr. Briggs then called on *Dr. Dean S. Fleming* who gave a report on a tuberculosis survey now being conducted among Mexican migratory workers in the Hollandale area. The survey is being made with the cooperation of the Christmas Seal organization and the Department of Employment and Security. Tests were given to 469 migrants and eighty-nine local people. The Mexicans were 39 per cent positive, and the local people 23.5 per cent positive.

Dr. Fleming stated that in general the children show negative findings. Beginning with the fifteen to nineteen year age group of migrants, 65 per cent were reactors. In early adulthood, almost 80 to 90 per cent reacted positively. The positive reactors have been x-rayed, but the results are not yet known. The Health Department hopes to obtain from this survey some age distribution of positive reactors. It may be much simpler, Dr. Fleming added, to x-ray all adult migrants.

LONGEVITY—BLOOD PRESSURE

Both life insurance companies and doctors will have to change their "sights" on blood pressure as a result of the largest statistical investigation ever made of the effects on longevity of increased blood pressure. This investigation covered the mortality experience over the years 1935-54. Its findings, just published under the title, "1959 Build and Blood Pressure Study," were made the first subject of discussion at the annual meeting of the Society of Actuaries held in New York City early in November, 1959.

Speaking of the findings on blood pressure, Dr. John J. Hutchinson of the New York Life Insurance Company, said, "Although this was not a clinical study, its implications should be of value to physicians. The consistent pattern of increased mortality from heart and circulatory diseases associated with slight increases in blood pressure emphasizes that clinicians cannot ignore the significance of small elevations in blood pressure. It is not reasonable to regard such variations as being within normal limits."

The actuaries agreed that even small elevations in blood pressure are associated with distinctly higher mortality and that this was the most notable finding of the four-year study. Most life insurance companies will have to reexamine their blood pressure ratings, they said, since the extra mortality found among persons with slight elevations in blood pressure may require the charging of an extra premium as a matter of fairness to other policyholders. The study, which covers nearly 4,000,000 persons, suggests that the incidence of elevated blood pressure is much higher than has been generally supposed.

The same comprehensive investigation revealed that persons with elevated blood pressure who were also overweight were subject to still higher mortality. This was likewise true of persons with elevated blood pressure and albuminuria.

On the other hand, the actuaries reported that during the past 60 years, there has been relatively little change in the excess mortality associated with overweight alone, except that tall overweights appear in recent decades to have become better risks. Accordingly, no major changes in life insurance ratings for overweights are anticipated. However, the ratings for underweight are expected to be lowered, because the mortality among underweights has improved considerably as compared with a generation ago when tuberculosis and pneumonia were the principal causes of death among such persons.

Moderate and marked overweight continues nevertheless to result in a serious impairment of longevity. Men weighing 35 pounds over average are subject to at least 25 per cent extra mortality, while men weighing as much as 50 pounds over average may experience up to 75 per cent higher mortality. The lowest mortality at ages over thirty is found among those 15 to 20 pounds below average weight which may, therefore, be considered as the best weight.

It is noteworthy, according to Mr. Lew, that nearly half of all men and women over thirty are 20 per cent or more above their best weights, although only about 6 per cent of all men and 11 per cent of all women weigh 20 per cent or more in excess of average.

Persons moderately or markedly overweight who reduced to about average weight were found to experience normal mortality for about ten years following reduction.

INSTITUTE OF LIFE INSURANCE

Communications

PRINCIPLES OF ETHICAL DRUG PROMOTION

We, members of the Pharmaceutical Manufacturers Association, recognizing our responsibilities and obligations to promote the public welfare and to maintain honorable, fair, and friendly relations with the medical profession, with associated sciences, and with the public, do pledge ourselves to the following statement of principles:

1. Prompt, complete, conservative and accurate information concerning therapeutic agents shall be made available to the medical profession.

2. Any statement involved in product promotional communications must be supported by adequate and acceptable scientific evidence. Claims must not be stronger than such evidence warrants. Every effort must be made to avoid ambiguity and implied endorsements. Whenever market, statistical or background information or references to unpublished literature or observations are used in promotional literature, the source must be available to the physician upon request.

3. Quotations from the medical literature or from the personal communications of clinical investigators in promotional communications must not change or distort the true meaning of the author.

4. If it is necessary to include comparisons of drugs in promotional communications, such comparisons must be used only when they are constructive to the physician and made on a sound professional and factual basis. Trademarks are private property that can be used legally only by or with the consent of owners of trademarks.

5. The release to the lay public of information on the clinical use of a new drug or of a new use of an established drug prior to adequate clinical acceptance and presentation to the medical profession is not in the best interests of the medical profession or the layman.

6. All medical claims and assertions contained in promotional communications should have medical review prior to their release.

7. Any violation of these principles brought to the attention of the President of the Pharmaceutical Manufacturers Association shall be referred by him to the Board of Directors.

(Passed by the Pharmaceutical Manufacturers Association Board of Directors, May 24, 1958)

HOW MANY MORE MEDICAL SCHOOLS?

No one can predict exactly the number of physicians needed in the future or the number of graduates needed to maintain a constant ratio between the two. The Bayne-Jones report recommended at least 8,700 medical graduates by 1970. The Surgeon General's Consultant Group on Medical Education recently recommended 10,400 M.D. graduates by 1975.

The following discussion is not based on either of the above estimates but rather upon a simple linear projection derived from past experience. These estimates of the future physician requirements correlate the expected population growth with a physician-population ratio of 132 physicians per 100,000 population which has prevailed over the last several years. Physician requirements computed on this basis and using the Census Bureau's Series II population estimates are shown in the first table.

Since 1930 the annual number of medical school graduates has averaged approximately 30 per 1,000 licensed physicians. The number of graduates projected in an estimate for succeeding years based on this rate is as follows:

Population Estimates	Physicians Needed (M.D.)	Graduates Needed (M.D.)
1960—180,126,000	237,766	7,133
1965—195,747,000	258,386	7,751
1970—213,810,000	282,229	8,467
1975—235,246,000	310,523	9,315
1980—259,981,000	343,175	10,295

ASSOCIATION OF AMERICAN MEDICAL COLLEGES

This Section is for you to voice your convictions, comments, and queries on all subjects political, economic, historic, humorous, scientific or otherwise, to many physicians. Writings not sufficiently formal and too brief for an editorial or a scientific manuscript are requested. Clinical and research observations, no matter how brief, similar to those in *The Lancet* (London), are particularly encouraged.

DISMISSAL OF ANTITRUST CHARGES

Of course, all of us at Lilly are pleased by the Court's decision that the poliomyelitis vaccine antitrust suit was so completely without basis that it was not even worthy of jury consideration. When the suit was first brought, we labeled it "complete nonsense," and we never had any doubt as to what the result would be.

We cannot help being deeply concerned that reputable business firms can be subjected to this kind of baseless attack. The harm done in terms of damage to public reputation by the mere bringing of the suit is incalculable. The waste of company executives' time and the expense of litigating such insupportable charges are deplorable.

Indianapolis, Indiana
December 1, 1959

EUGENE N. BEESLEY, *President*
Eli Lilly and Company

NOTE: In the United States District Court in Trenton, New Jersey, the Justice Department had charged that the five defendant manufacturers had conspired to fix prices of the vaccine. Judge Phillip Forman agreed with the defense attorneys that the Government had not proved its case and dismissed the suit without sending it to the jury.

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SEARLE

Meetings and Announcements

INTERNATIONAL

Second Bahamas Surgical Conference, British Colonial Hotel, Nassau, Bahamas, December 28, 1959 until January 16, 1960.

International College of Surgeons, Twelfth Biennial International Congress, Rome, Italy, May 15-18, 1960.

Fourth International Goiter Conference, July 5-9, 1960, London, England, under the auspices of the London Thyroid Club and the American Goiter Association. Application blanks are available from John C. McClintock, M.D., 149½ Washington Avenue, Albany 10, New York, U.S.A.

Pan American Medical Association Congress, Mexico City, Mexico, May 2-11, 1960. For further information, write Dr. Joseph J. Eller, Director General, 745 Fifth Avenue, New York, New York.

International Congress of Gastroenterology, sixth meeting, Leyden, Netherlands, April 20-24, 1960. Patron: His Royal Highness the Prince of the Netherlands.

Third International Congress of Physical Medicine, Washington, D. C., August 21-26, 1960.

Second International Symposium on Changing Concepts in Medicine (Congenital Heart Disease), Bellevue-Stratford Hotel, Philadelphia, Pennsylvania, April 28, 29, 30, 1960. For further information write Doctor Charles P. Bailey, The Deborah Hospital, Browns Mills, New Jersey, or Doctor Charles P. Bailey, Deborah National Office, 901 Walnut Street, Philadelphia 7, Pennsylvania.

International Medical Assembly of Southwest Texas, Postgraduate Assembly, Hilton Hotel, San Antonio Texas, January 25-27, 1960.

American Institute of Ultrasonics in Medicine, Second International Conference, Statler-Hilton Hotel, Washington, D.C., August 20, 1960.

NATIONAL

The Biophysical Society, Fourth Annual Meeting, Sheraton Hotel, Philadelphia, Pennsylvania, February 24-26, 1960. For further information write to H. P. Schwan, Chairman, Local Arrangements, University of Pennsylvania, Philadelphia 4, Pennsylvania, or to O. H. Schmitt, Chairman, Program Committee, University of Minnesota, Minneapolis 14, Minnesota.

American College of Allergists Graduate Instructional Course and Annual Congress, The Americana Hotel, Bal Harbour, Miami Beach, Florida, February 28-March 4, 1960. For further information, write John D. Gillaspie, M.D., Treasurer, 2049 Broadway, Boulder, Colorado.

Third Annual Oklahoma Colloquy on Advances in Medicine, University of Oklahoma Medical Center, Oklahoma City, March 24-26, 1960.

Eighth Postgraduate Course in Diabetes and Basic Metabolic Problems, American Diabetes Association, Ambassador Hotel, Los Angeles, California, January 20-22, 1960.

The Twenty-third Annual Meeting of the New Orleans Graduate Medical Assembly, headquarters at the Roosevelt Hotel, New Orleans, Louisiana, March 7, 8, 9, and 10, 1960.

The Eleventh Annual Symposium on Recent Advances in the Study of Venereal Diseases, Palmer House, Chicago, Illinois, April 7 and 8, 1960.

The New Orleans Graduate Medical Assembly, Twenty-third Annual Meeting, Roosevelt Hotel, New Orleans, Louisiana, March 7, 8, 9, and 10, 1960.

American College of Physicians, Postgraduate Course Number Five, Current Concepts of the Rheumatic Diseases—Their Recognition and Management, Cornell University Medical College and The Hospital for Special Surgery, New York, New York, January 11-15, 1960.

American College of Physicians, Postgraduate Course Number Six, Internal Medicine—Selected Subjects, Henry Ford Hospital, Detroit, Michigan, January 25-29, 1960.

American College of Physicians, Postgraduate Course Number Seven, Recent Advances in Metabolic Diseases. The Mount Sinai Hospital, New York, New York, February 8-12, 1960.

University of Colorado Medical Center, Postgraduate Courses; General Practice Review (Sixth Annual), January 10-16, 1960; Physical Medicine and Rehabilitation in Neuromuscular and Medical Conditions, June 1-3, 1960; Conference on Research in Emphysema (Aspen, Colorado), June 17-19, 1960; and Clinical Hematology, June 20-25, 1960 (tentative).

American College of Chest Physicians, Council on Postgraduate Medical Education, Thirteenth Annual Postgraduate Course on Diseases of the Chest at the Sheraton Hotel, Philadelphia, Pennsylvania, March 14-18, 1960.

CONTINUATION COURSES

Medical Continuation Courses, Center for Continuation Study, University of Minnesota: Ophthalmology for Specialists, January 11-13, 1960; Surgery for Surgeons, January 21-23, 1960; Cardiovascular Diseases for General Physicians and Specialists, February 8-10, 1960; Pediatric Neurology for Specialists, February 15-19, 1960; Pediatrics for General Physicians, February 29-March 2, 1960; and Internal Medicine for Internists, March 14-16, 1960.

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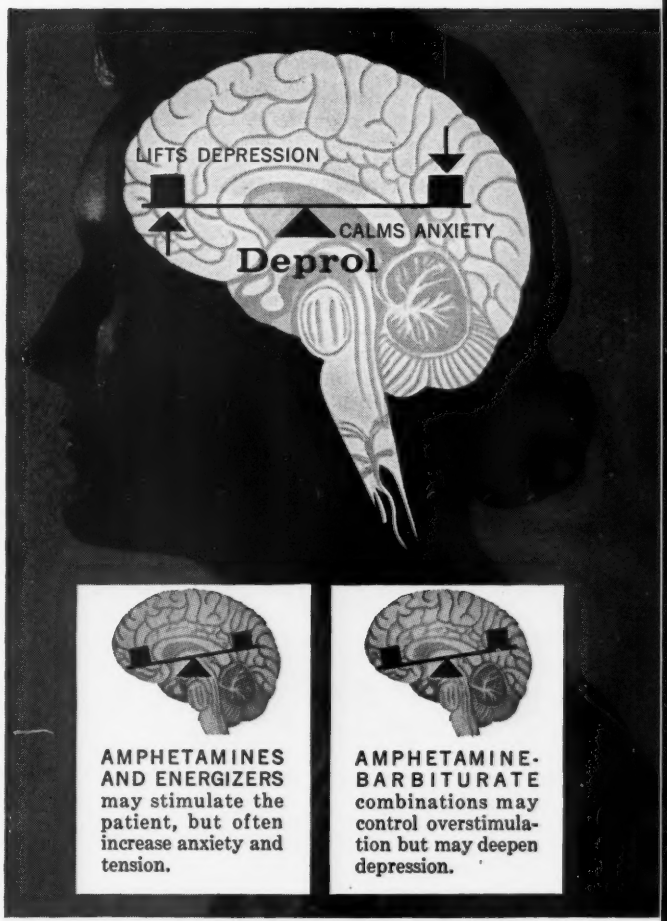
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(Continued from page 1846)

MONOGRAPH PRIZES OFFERED

The American Academy of Arts and Sciences has announced three $1,000 prizes to be awarded annually to the authors of unpublished monographs; one each in the fields of the Humanities, Social Sciences and Physical and Biological Sciences.

The final date in 1960 for receipt of manuscripts by the Committee on awards is October 1. Announcement of the awards will be made in December, 1960.

Full details concerning these prizes may be secured on request by sending a stamped self-addressed envelope to the Committee on Monograph Prizes, American Academy of Arts and Sciences, 280 Newton Street, Brookline Station, Boston 46, Massachusetts.

OPHTHALMOLOGY COURSES OFFERED

The New York University Postgraduate Medical School offers the following courses in Ophthalmology starting in February, 1960:

Ophthalmic Plastic Surgery (for specialists)—A part-time course, 2 to 5 p.m., February 29 through March 4, 1960—Covers the essentials of ophthalmic plastic surgery for the practicing ophthalmologist. Special emphasis is laid on the more common fundamental procedures peculiar to lid surgery. Under the direction of Dr. Sidney A. Fox.

Motor Anomalies of The Eye (for specialists)—A full-time course given in two parts: Part I, March 7 through 12, 1960. The course is made as practical as possible, and the relation of the muscle balance to refraction is always considered in the prescribing of glasses. Part II, March 14 through 18. The question of treatment, both operative and non-operative, and the use and limitations of each are considered. Under the direction of Dr. Harold W. Brown.

Ocular Expressions of Systemic Disease—A part-time course, 2 to 5 p.m., March 21 through 25, 1960. Covers clinical and pathological changes associated with diabetes, hypertension, nephritis, thyroid dysfunction, blood dyscrasias, and optic nerve disease. Some associated eye and skin evidences of systemic diseases are discussed. Under the direction of Dr. Isadore Givner.

Surgery of the Eye (for specialists)—A full-time course, March 28 through April 2, 1960. Consists of lectures on cataract surgery, glaucoma surgery, ocular muscle surgery, ptosis surgery, surgical treatment of retinal detachment, corneal transplantation, and plastic surgery of the eye. Practical work on technique of eye operations on the cadaver. Under the direction of Dr. Rudolph Aebli.

Ophthalmoscopy—A part-time course, 9 a.m. to 12 noon, April 25 through 29, 1960. A study of the normal fundus, congenital anomalies, diseases of the vitreous, retina, choroid, optic nerve head, and traumatic fundus changes. Under the direction of Dr. George N. Wise.

Histopathology—A part-time course, 1 to 4 p.m., April 25 through 29, 1960. Consists of lectures, demonstrations, and microscopic study of exemplary material covering the following subjects: Intraocular inflammation, pyogenic, granulomatous, and nongranulomatous; glaucoma and hypotension; trauma; intraocular tumors; fibroblastic states; vascular-metabolic states. Under the direction of Dr. A. Marvin Gillman.

For additional information, write to: Office of the Associate Dean, New York University Postgraduate Medical School, 550 First Avenue, New York 16, New York.

INTERNATIONAL ACADEMY OF PROCTOLOGY AWARD CONTEST

The International Academy of Proctology announces its Annual Cash Prize and Certificate of Merit Award Contest for 1959-1960. The best unpublished contribution on proctology or allied subjects will be awarded $100.00 and a Certificate of Merit. The winning contribution will be selected by a board of impartial judges, and all decisions are final.

The formal award of the first prize, and presentation of other certificates, will be made at the annual convention dinner dance of the International Academy of Proctology, April 27, 1960, at the Americana Hotel, Miami Beach, Florida.

The International Academy of Proctology reserves the exclusive right to publish all contributions in its official publication, *The American Journal of Proctology*. All entries are limited to 5,000 words, must be typewritten in English, and submitted in five copies. All entries must be received no later than the first day of February, 1960. Entries should be addressed to: Alfred J. Cantor, M.D., International Academy of Proctology, 147-41 Sanford Avenue, Flushing 55, New York.

AMERICAN ORTHOPSYCHIATRIC ASSOCIATION

Specialists in the behavioral sciences from all parts of the United States and Canada will focus on mental health problems of the community and society at the 37th annual meeting of the American Orthopsychiatric Association on February 25-27, 1960, at the Sherman Hotel, Chicago.

The program will include joint sessions with the American Public Health Association, the World Federation of Mental Health, the American Group Psychotherapy Association, the Society for Projective Techniques, the American College Health Association and the American Association of Psychiatric Clinics for Children.

Topics to be covered in more than seventy scientific papers include: animal research, genetics of mental disease, management of brain-damaged adolescents, total care program for psychiatric patients, special school program for emotionally disturbed children, learning problems, desegregation process and delinquency.

Further information is available from Dr. Marion F. Langer, Executive Secretary, American Orthopsychiatric Association, 1790 Broadway, New York 19, New York.

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LEVOPHED MAINTAINS BLOOD PRESSURE IN BACTEREMIC SHOCK

Levophed (norepinephrine) by intravenous infusion was the only drug capable of maintaining blood pressure in an obstetrics patient with bacterial shock unrelated to blood loss, according to Dr. Harry Oxorn of McGill University.

Writing in the *American Journal of Obstetrics and Gynecology* (78:567, 1959), he reports on measures used in the management of a case of premature delivery at seven months. Bacterial shock developed seven hours after delivery of a dead fetus. The patient had experienced spontaneous rupture of the membranes two days previously.

Treatment of the bacterial shock by infusion of a plasma expander was of little help. Levophed (Winthrop) raised blood pressure, which had been unobtainable, to 120/70 and maintained it at 100 mm. for the next five days, Dr. Oxorn states. Blood pressure was extremely labile, he notes, but responded immediately to an increase in the infusion rate of Levophed.

He cites similar cases reported by another research group, which also concluded that Levophed appeared to be the only agent able to restore and maintain blood pressure. In his own case report, he says that hydrocortisone and antibiotics were given and close attention paid to fluid balance.

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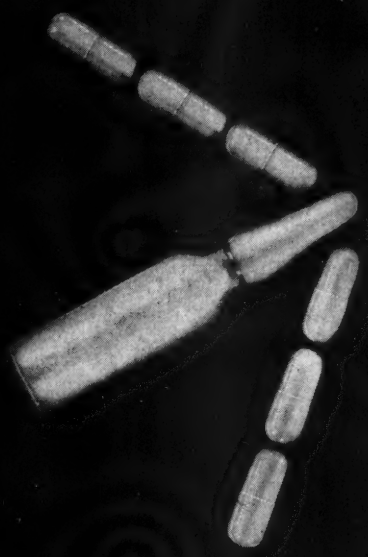
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Cosa-Terramycin Pediatric Drops – peach flavored, 5 mg./drop (100 mg./cc.), 10 cc. bottle with plastic calibrated dropper

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Woman's Auxiliary

ZUMBRO VALLEY ACTIVITIES

The Zumbro Valley Medical Auxiliary held its quarterly fall meeting on November 5, 1959, at the Ability Building Center, located at the Samaritan Nursing Home in Rochester, Minnesota. Mrs. M. F. Fellows of Duluth, state auxiliary president, was a special guest.

A panel discussion on the Ability Building Center and a tour of the workshop was held. Panelists were Mrs. G. M. Lowry, member of the board of directors of the ABC and one of the organizers of the project; David Griggs, managing director of ABC; Charles Timm, office supervisor; Kenneth Zubay, president of ABC; and Dr. D. J. Erickson of the Mayo Clinic.

The ABC was incorporated in 1956 and is an Easter seal affiliate. From three workers, the organization has grown to between forty-five and fifty employes, with a constant turnover as the disabled persons find permanent employment. Dr. Frank Krusen, of the Mayo Clinic, with Dr. D. J. Erickson, helped to establish the institution because of the need to place disabled persons in gainful work. Many of the employes at the center are now able to make their own living, rather than be on state aid.

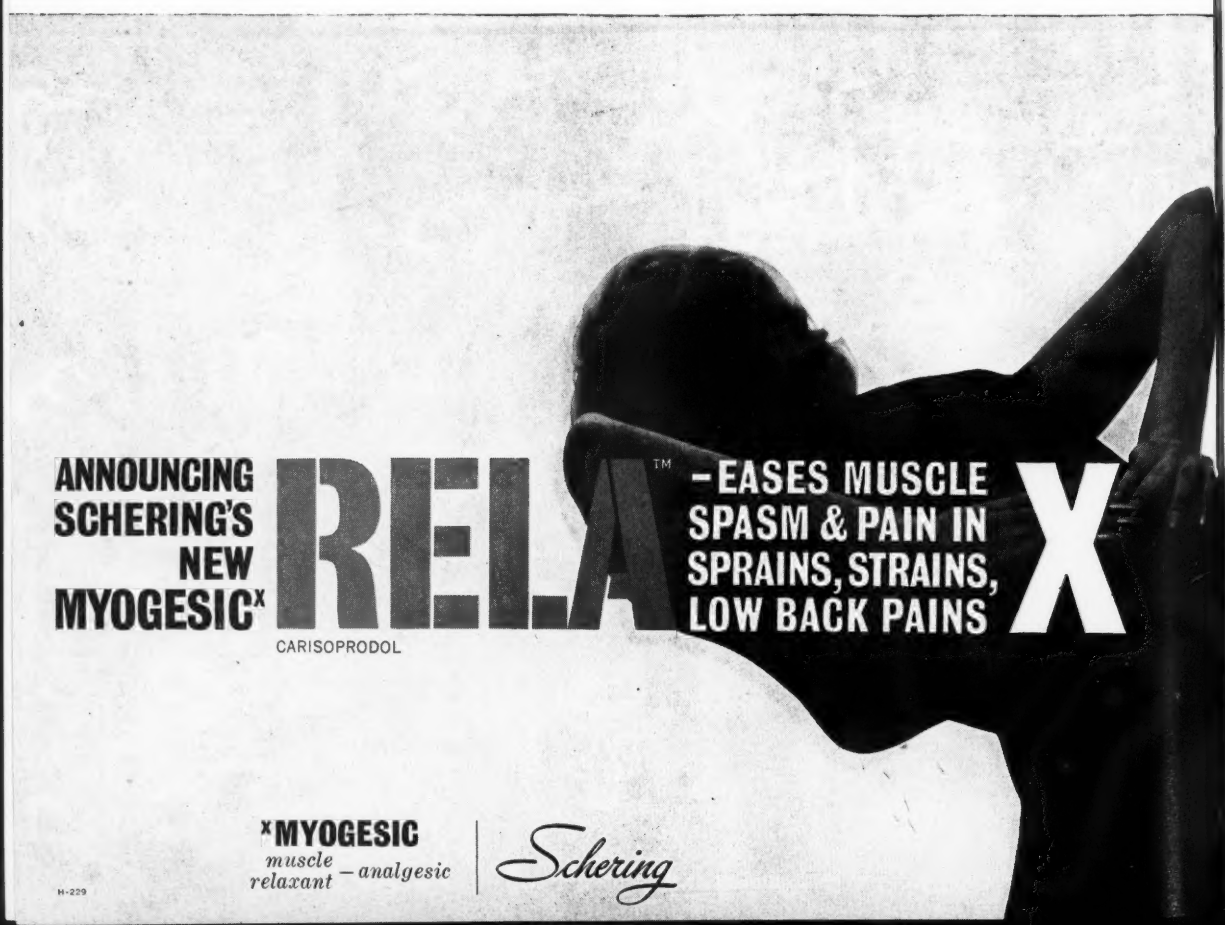
The auxiliary currently is planning a Christmas party to be held at the Ability Building Center for the employes. Each month members of the auxiliary provide cookies for a special party which is held for the disabled workers who are employed at the center at that time.

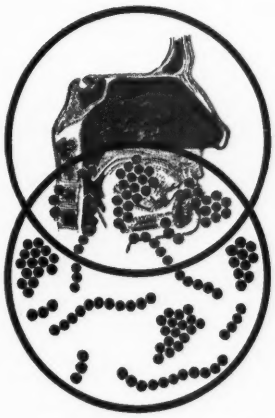
The Zumbro Valley Medical Auxiliary officers and committee chairmen are as follows: Mrs. O. H. Beahrs, president; Mrs. J. E. Edwards, vice president; Mrs. D. G. Hanlon, treasurer; Mrs. John E. Verby, Secretary; Mrs. James K. Masson, press and publicity; Mrs. G. M. Martin and Mrs. D. J. Erickson, membership; Mrs. A. A. Frethem, American Medical Education Foundation; and Mrs. J. W. DuShane, legislation.

STEELE COUNTY AUXILIARY ENTERTAINS FUTURE NURSES

The Steele County Medical Auxiliary entertained high school sophomores who are interested in nursing on the afternoon of October 20 at Owatonna. Miss Melbostad, Owatonna school nurse, and Miss Pat Manley, Steele County public health nurse, spoke to the

(Continued on page 1868)





when upper respiratory congestion is complicated by bacterial invaders

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Dosage:

Adults—2 to 4 tablets or tsp. initially, followed by 2 tablets or tsp. every 4 to 6 hours until the patient has been afebrile 3 days. *Children 8 to 12* — 2 tablets or tsp. initially, followed by 1 tablet or tsp. every 6 hours. *Children under 8*—dosage according to weight.

The palatability, convenience and effectiveness of the Suspension make it especially suitable for children and for those older patients who prefer liquid medication.

References: 1. Cecil, R. L., et al.: J.A.M.A. 124:8 (Jan. 1) 1944. 2. Fabricant, N. D.: E.E.N.T. Monthly 37:460 (July) 1958. 3. Beckman, H.: Drugs, Their Nature, Action & Use, Saunders, Philadelphia, 1958, p. 527.

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STEELE COUNTY AUXILIARY ENTERTAINS FUTURE NURSES

(Continued from page 1866)

group on nursing, following which a tour of the Owatonna City hospital was made.

Mrs. John Fischer and Mrs. Alfin Jorde brought thirteen girls from the Blooming Prairie high school to Owatonna.

SENATOR HOLAND ADDRESSES MOWER COUNTY AUXILIARY

Senator P. J. Holand addressed the Mower County Medical Auxiliary on October 26 at the home of Mrs. L. G. Flanagan.

Members also discussed an essay contest for high school students and a film was shown.

DISTRICT FOUR MEETING HELD AT MANKATO

The District Four auxiliary meeting was held recently in Mankato at the home of Mrs. Alton Lindblom, Langness Heights. Mrs. Lindblom is regional advisor of the auxiliary. Assisting as hostesses were Mrs. A. M. Scheidel and Mrs. John C. Wohlrabe.

Mrs. M. F. Fellows of Duluth, state auxiliary president, and Mrs. W. P. Gardner of St. Paul, president-elect, were special guests. Mrs. Fellows brought out five points for the auxiliary program in her talk—membership, subscribing 100 per cent to the national bulletin; American Medical Foundation where money is needed for student aid and scholarships; equipment and salaries for added teachers; and legislative matters, knowing every bill concerning medicine and how it affects members; and Allied Careers, encouraging young people to take up medical careers.

Mrs. Gardner encouraged all doctors' wives to join the auxiliary and to watch for the daily radio program over KYSM to be called "Doctor, Tell Me."

District Four consists of Blue Earth, Brown, McLeod, Nicollet-Le Sueur, Scott-Carver and Waseca counties. Each was represented by officers or members of their respective counties.

WRIGHT COUNTY MEDICAL AUXILIARY

The Wright County Medical Auxiliary held its November 3 meeting in Buffalo. After dinner, the business meeting was held at the home of Mrs. Robert Sandeen.

Auxiliary officers for the year are as follows: Mrs. R. D. Thielen of St. Michael, president; Mrs. W. E. Hall, Maple Lake, vice president; Mrs. G. Purves, Buffalo, secretary-treasurer; Mrs. T. J. Catlin, Buffalo, historian; Mrs. Purves, Buffalo, Bulletin chairman; Mrs. W. P. Anderson, Buffalo, cancer; Mrs. W. E. Hart, Monticello, civilian defense; Mrs. W. T. Greenfield, Cokato, medical and surgical relief; Mrs. F. E. Ellison,

(Continued on page 1872)



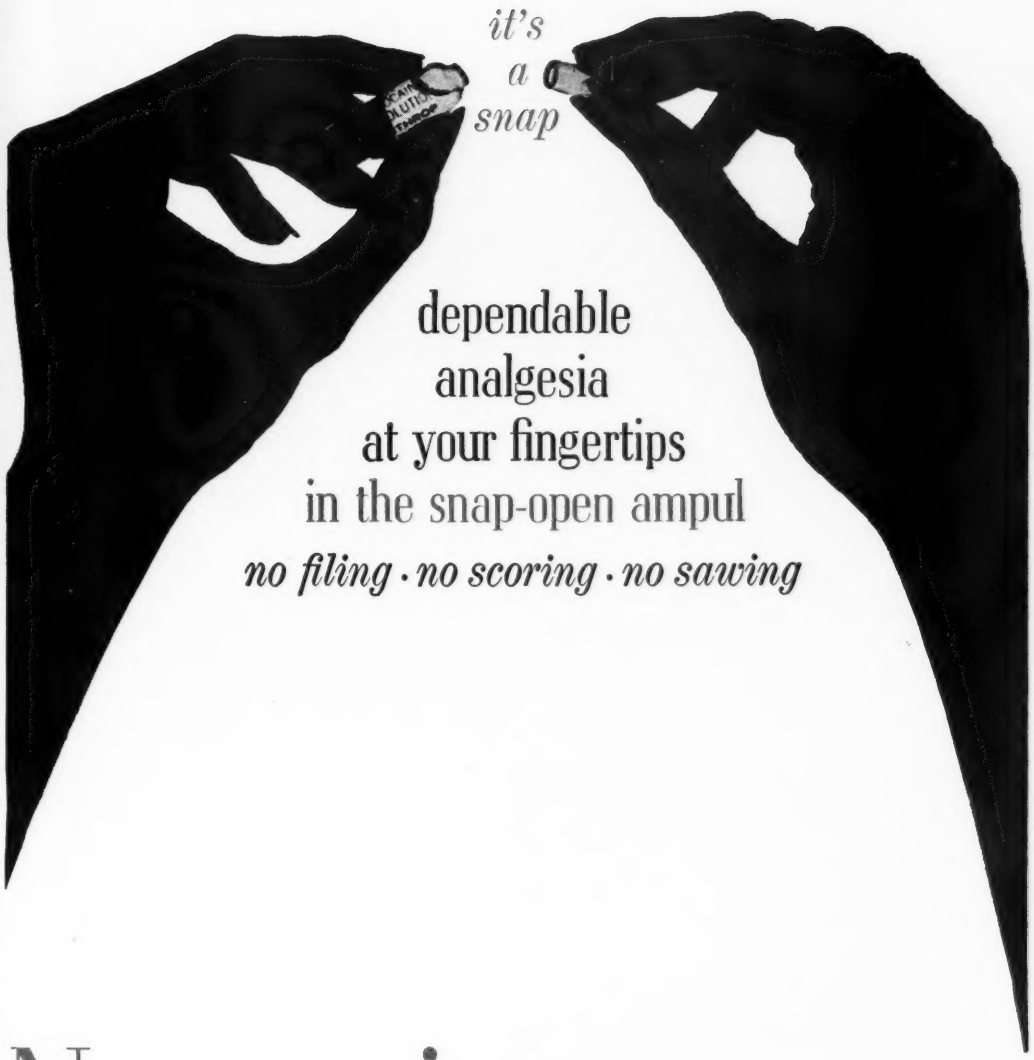
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WRIGHT COUNTY MEDICAL AUXILIARY

(Continued from page 1868)

Monticello, mental health; Mrs. R. M. Sandeen, Buffalo, publicity; Mrs. Pierre Guilfoile, Delano, legislative.

DISTRICT ONE MEDICAL AUXILIARY SESSION

A regional meeting of the Woman's Auxiliary was held at the Oaks in Winona on October 28. County medical auxiliaries in District One represented at the meeting included Rice, Steele, Zumbro Valley, Wabasha, Goodhue, Mower, and Winona.

A one o'clock luncheon preceded the program. State committee chairmen were speakers. Mrs. W. P. Gjerde of Lake City spoke on mental health; Mrs. Warren Wilson, Northfield, on medical and surgical relief; and Mrs. John W. Gridley, Arlington, on the American Medical Education Foundation.

RAMSEY COUNTY AUXILIARY

Board members of the Ramsey County Medical Auxiliary met on November 10 in the Medical Arts Library, St. Paul. Mrs. Hanns Schwyzer called the meeting to order, and representatives of Community Service Committees gave reports on meetings they had attended.

Mrs. David Norman gave a detailed account of the Civil Defense meeting she and Mrs. Neil recently attended in Minneapolis. Literature and questionnaires will be distributed to the auxiliary. Members are requested to answer the questions and return them to the organization.

Mrs. Charles Froats, American Red Cross representative, told of the need for Grey Ladies and for helpers for the blood bank—the main project of the Auxiliary for the year.

Edna Imm, portrait painter, presented a demonstration of her work at the November luncheon and meeting held in the University Club.

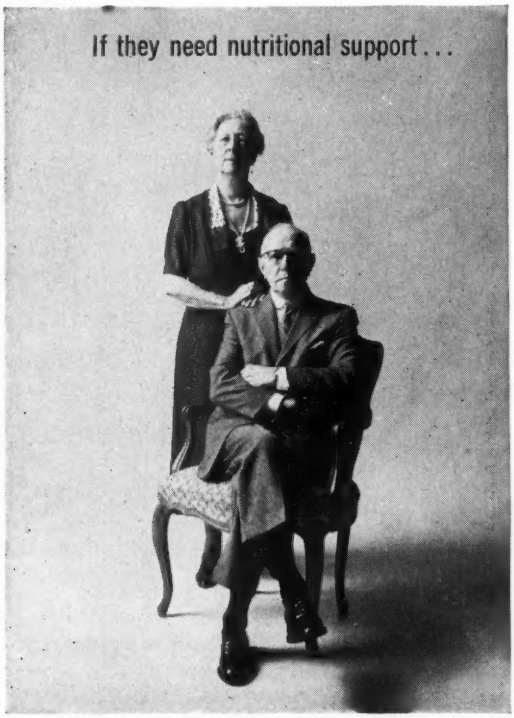
MEDICAL AUXILIARY TEA IN GRAND RAPIDS

Members of the Range medical auxiliary from Duluth, International Falls, and the Range towns attended the organization's annual fall membership tea on Thursday, October 15, in Grand Rapids at the home of Dr. and Mrs. A. V. Grinley.

Auxiliary president is Mrs. R. T. Kelly of Grand Rapids. Other officers are Mrs. Bernard Flynn of Hibbing, vice president; Mrs. Vernon Erickson of Grand Rapids, secretary; and Mrs. Donald Nollett of Hibbing, treasurer.

Mrs. M. F. Fellows of Duluth, state president, and Mrs. Roy Pedersen of Duluth, para-medical career state chairman, were present for the afternoon.

Tea arrangements were under the direction of Mrs.



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Grinley, chairman, and committee members, Mrs. R. W. Brockway and Mrs. Kelly of Grand Rapids, and Mrs. Kelly Rowles of Coleraine. Other Grand Rapids physicians' wives were hostesses.

Mrs. Andrew Sinamark of Hibbing is the auxiliary's membership chairman. Other members of her committee are Mrs. A. N. Antonow of Virginia and Mrs. L. E. Karges of Grand Rapids.

SOUTHWESTERN MEDICAL AUXILIARY

The regular meeting of the Southwestern Minnesota Medical Auxiliary was held October 26 at the home of Dr. and Mrs. Robert Sawtell of Worthington, following a dinner for members of the Medical Society and their wives at a local steak house. Special guests were Mrs. M. F. Fellows of Duluth, state president, and Mrs. W. P. Gardner of St. Paul, president-elect. Mrs. Fellows spoke to the group, giving a brief résumé of the School of Instruction and presenting the current goals of the auxiliary. Mrs. R. J. Kotval of Pipestone, vice-president, presided.

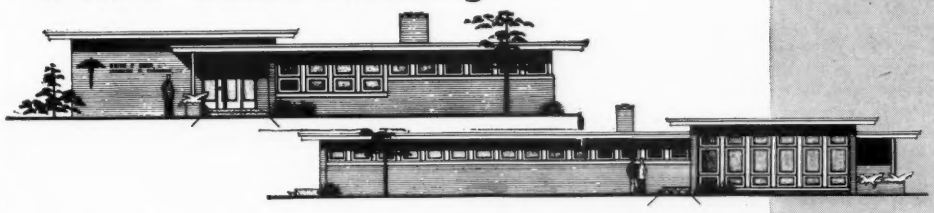
REGION THREE MEETING HELD

A Region Three meeting was held in Marshall on Tuesday, November 3, 1959, at the Marshall Cafe. Mrs. M. I. Hauge, Region Three Advisor, presided at the meeting. Representatives from three medical auxiliaries, Camp Release, Lyon-Lincoln, and Renville-Redwood, attended. Mrs. M. F. Fellows, State President, was the honored guest.

After a welcome by Mrs. R. T. Olson, President of Lyon-Lincoln Auxiliary, Mrs. M. F. Fellows gave a résumé of the fall school of instruction. Mrs. J. Strauchler, AAPS Essay Contest chairman, gave a brief talk on the essay contest and urged each auxiliary to sponsor the contest. Arrangements were made to have a spring meeting.

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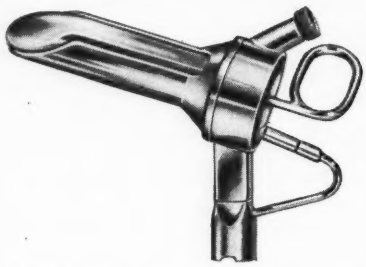
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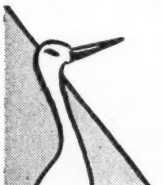
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In Memoriam

FRANK H. CLAY

Dr. Frank H. Clay, retired, died at Winter Park, Florida, on November 6, 1959. He was seventy-five years of age at the time of his death.

Doctor Clay graduated from the University of Minnesota School of Medicine in 1909. He practiced in Winona and St. Charles and was a member of the Winona County Medical Society and the Minnesota State Medical Association.

He is survived by his wife, Alice, of Longwood, Florida; one daughter, Mrs. John Hanner, Longwood; two sons, Leland H. Clay, Beverly Hills, California, and Doctor Lyman B. Clay, Minneapolis; and one brother, Doctor R. L. Clay, Lewiston, Minnesota.

ROBERT K. GRAU

Dr. Robert K. Grau, of St. Paul, died October 31, 1959, at the age of fifty years. The deceased was a member of the staff at St. Luke's, Midway, Children's, and Bethesda Hospitals in St. Paul.

He was a member of the Ramsey County Medical Society, the Minnesota State Medical Association, and the American Medical Association. He was also a Mason and Shriner. Other memberships held by Doctor Grau included the following: American Academy of General Practice; American Association of Railway Surgeons; Midland Hills Golf Club; St. Paul Athletic Club; Midway Civic Club. He was a member of the Merriam Park Presbyterian Church.

The deceased was born in Manning, Iowa, and received his preliminary education in the Dennison, Iowa, public schools. He attended the University of Iowa, Iowa City, and obtained his medical degree from the University of Iowa.

He is survived by his widow, Sadie, daughter, Barbara Lynn, both of Falcon Heights; his mother, Mrs. Emma Grau of Dennison, Iowa, and two brothers, Dr. A. H. Grau of Dennison, and Walter Grau of Walnut Creek, California.

BENEDIK MELBY

Dr. Benedik Melby, a Blooming Prairie physician for fifty-four years, died October 11, 1959. He was eighty-one years old at the time of his death. Doctor Melby was born in Whitehall, Wisconsin, and attended high school at Merrillan, Wisconsin. He graduated from the University of Minnesota Medical School and interned at Abbott Hospital in Minneapolis. He practiced medicine for one year at Hayfield, Minnesota, before coming to Blooming Prairie in 1905. The deceased was active in civic affairs during the majority of his life time. He was a member of the Blooming Prairie board of education from 1916 to 1955 and received the "Distinguished Service Award" from the Minnesota Education Association in 1950. He was also a member of the American Medical Association, Minnesota State



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l-Lysine Monohydrochloride	25 mg.
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Calcium (as $CaHPO_4$)	157 mg.
Phosphorus (as $CaHPO_4$)	122 mg.
Boron (as $Na_2B_4O_7.10H_2O$)	0.1 mg.
Copper (as CuO)	1 mg.
Fluorine (as CaF_2)	0.1 mg.
Manganese (as MnO_2)	1 mg.
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Medical Association, Steele County Medical Society, Masonic lodge, Eastern Star, Shrine organization, Commercial club and Blooming Prairie Lions club.

On June 17, 1953, the Blooming Prairie community held a Doctor Melby night in honor of the Blooming Prairie physician. He was also awarded a "fifty-year pin" at the Minnesota State Medical Association meeting in 1953 at St. Paul.

Survivors include his widow, Julia; one daughter, Lois Melby of Anoka, Minnesota, and three sisters, Miss Elizabeth Melby of New Haven, Connecticut, Mrs. Ben Isbill of Auburn, Washington, and Mrs. Nellie Anderson of Auburn, Washington.

CHESTER J. OLSON

Dr. Chester J. Olson, physician and surgeon in the Belle Plaine community for thirty-four years, died October 19, 1959, following a heart attack. He was sixty-four years old at the time of his death.

The deceased was a native of Dassel, Minnesota. He was a graduate of the University of Minnesota Medical School and served his internship in a White Springs, New York, Hospital. He was also a registered pharmacist.

Dr. Olson began his practice in Belle Plaine in 1925 as an associate of Dr. F. J. von Bohland. The following year, he acquired the von Bohland practice. He was a member of the Scott-Carver County Medical Society, Minnesota State Medical Association, and the American Medical Association.

He is survived by his wife Alyce, his sister, Mrs. Elmer Dahlin, and an uncle, Dr. O. A. Olson.

KARL A. WALFRED

Dr. Karl A. Walfred, of St. Cloud, died October 22, 1959, at the age of sixty-nine years. For the past four years, Doctor Walfred had served as Stearns County coroner.

The deceased received his early education in Isanti County and was graduated from Bethel Academy in 1911. In 1917, he received his Bachelor of Science degree from the University of Minnesota. His schooling was interrupted for a period during World War I, when he served in the Army. Upon his return he continued his studies at the University, receiving his Doctor of Medicine degree in 1922.

Doctor Walfred practiced in Raymond until 1924, when he moved to Cold Spring, where he was in practice for six years. In 1934, he moved to St. Cloud and had been in practice there since.

Doctor Walfred was a member of the Stearns-Benton County Medical Society, the Minnesota State Medical Association, and the American Medical Association. He was also a member of the General Practitioners of Minnesota, a past president of the staff at St. Cloud hospital and was listed in Who's Who of Physicians and Surgeons of the World.

Surviving are a sister Mrs. Josephine Hatfield, San Francisco; and brothers Paul Anderson, Minneapolis and Dr. F. E. Anderson, Underwood, North Dakota.

The Physician's Diary

Tribute to **Dr. J. Arthur Myers** of the University of Minnesota, international authority on tuberculosis, was paid by **Dr. Willard E. Peterson** of Willmar, at the regional conference on tuberculosis in Willmar on October 28. Dr. Myers, principal speaker at the dinner meeting at the Elks Club, stressed the value of using Minnesota's strong tuberculosis control program to detect active TB, especially in view of the several recent outbreaks of the disease in different parts of the state. Dr. Peterson, president of the Kandiyohi County Tuberculosis and Health Association, presided at the four-county meeting. At the meeting were about 50 volunteer Christmas Seal workers, public health nurses, and medical and civic leaders from Kandiyohi, Meeker, Redwood and Renville counties.

* * *

Dr. A. B. Rosenfield, director of the division of special services of the Minnesota Department of Health, has been elected president of the Minnesota Public Health Conference for 1960. Other officers include **Dr. Robert K. Anderson,** professor of veterinary bacteriology and public health, University of Minnesota, first vice president, and **Dr. Stewart C. Thomson,** professor and associate director of the School of Public Health, University of Minnesota, treasurer.

* * *

Dr. Vernon G. Kuhlmann has joined **Dr. James Reinhardt** in the practice of medicine in Alexandria. A specialist in surgery, Doctor Kuhlmann was released from the U. S. Navy in July after completing his required years of service.

* * *

Dr. John F. Briggs, St. Paul internal medicine specialist, addressed the St. Paul and Minneapolis District Dental Societies at their annual combined meeting on November 10. His speech was on "The Professional Man's Dilemma."

* * *

Four members of the faculty of the Mayo Foundation have been elected to the University Senate of the University of Minnesota. They are: **Drs. O. T. Clagett, K. B. Corbin, Victor Johnson** and **R. D. Miller,** all elected by faculty ballot. Dr. Johnson also served as a Senate member last year.

* * *

Dr. Donald D. Metz, who has conducted a medical practice at the Buffalo Lake Community Clinic the past five years, has accepted a position at the Robbinsdale Clinic. He began his work in Robbinsdale on November 1, where he is now associated with **Dr. Roger Lienke** and **Dr. Frank Rice** at the Robbinsdale Clinic.

* * *

Dr. J. E. Douglass, medical director of the Mineral Springs sanatorium, Cannon Falls, was the principal speaker at the eight-county conference on tuberculosis at the sanatorium on October 20. Attending were volunteer health workers, physicians and civic leaders interested in public health problems of Goodhue, Dakota, Freeborn, Mower, Olmsted, Rice, Steele and Washington counties.

* * *

The Hennepin County Tuberculosis Association was represented by **Dr. Charles E. Merkert,** member of the board, at the recent Mississippi Valley Conference of Tuberculosis held in Springfield, Illinois.

* * *

Dr. Walter E. Hinz, associated with the Lakeland Medical Center in Willmar, attended a graduate refresher course in obstetrics and gynecology, conducted by Northwestern University's medical school.

* * *

A course for public health nurses on emotional problems of the adolescent was held November 9-10 at the University of Minnesota's Center for Continuation Study. The faculty included: **Dr. Gove Hambidge, Jr.,** Minneapolis psychiatrist, and **Dr. Carl Schwartz,** psychiatrist with the Mower County Mental Health Unit.

* * *

Dr. Robert L. Stein is now associated with **Dr. J. W. Bratholdt** and **Dr. D. R. Philp** in their medical practice in Watertown.

* * *

Dr. Harold Hermann, Minneapolis pediatrician, was the speaker at a recent meeting of the Watertown PTA. The theme of the meeting was "Adjustments to Life," and Dr. Hermann's subject was "The Parents' Responsibility in Sex Education to Their Children."

* * *

The gap between hospitals and the Duluth Rehabilitation center must be bridged, the St. Louis County Medical Society was told recently by **Dr. Frederic J. Kottke,** head of the University of Minnesota department of physical medicine and rehabilitation. Dr. Kottke declared that "Too many patients are lost between the hospital and center." These are patients who are in no condition to go to the center for care when released from the hospital, he explained. He advocated use of a psychiatrist who specializes in rehabilitation to chart a "complete rehabilitation program" for patients and creation of facilities into which bedridden patients needing rehabilitation could be transferred from the hospital.

* * *

The University of Minnesota regents have elected **Dr. Charles W. Mayo,** Rochester, vice chairman and second vice president of the board. Dr. Mayo succeeds Regent George W. Lawson, St. Paul, who died in September.

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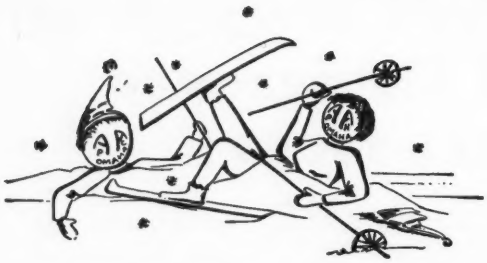
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Recently elected officers of the Minneapolis Obstetrical and Gynecological Society are: Doctors **Maxwell M. Barr**, president; **George W. Janda, Jr.**, vice president; and **Richard R. Fliehr**, secretary-treasurer. The Society plans four meetings during the coming year, the first meeting being held at the Minneapolis Athletic Club on December 9. **Dr. Joseph Pratt** of the Mayo Clinic will be the featured speaker, presenting "The Newer Aspects of Gynecological Surgery."

* * *

Dr. William H. ReMine, head of a section of surgery at the Mayo Clinic, and assistant professor of surgery in the Mayo Foundation, Graduate School, University of Minnesota, has been judged winner of an award for his surgical motion picture, "The Embryologic Development and Management of Branchial Cleft Cysts and Sinuses" by the American College of Surgeons. The film was shown at the clinical congress of the American College of Surgeons in Atlantic City on September 28 to October 2, and the award will be presented to Dr. ReMine at the 1960 clinical congress of the organization.

* * *

At the regular meeting of the Minnesota Society of Neurology and Psychiatry held in St. Paul on November 10, the scientific program included the following presentations: "The Anatomy of Savor" by **Dr. Edward C. Clark**, Rochester, and "Differential Treatment and Prognosis in Schizophrenia" by **Dr. Werner Simon**, Minneapolis.

* * *

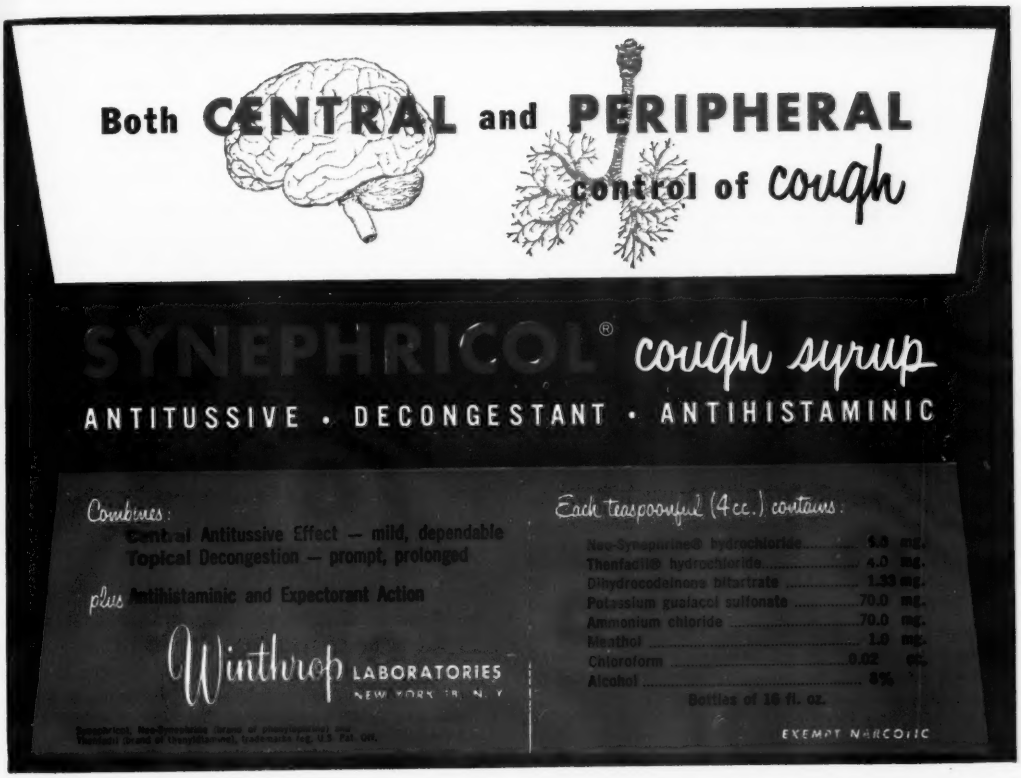
The Minnesota Medical Foundation, on October 30, awarded a grant of $13,716 to the University of Minnesota Medical School's department of medicine to finance a two-year program of diabetes research. A research team directed by **Dr. Frederick C. Goetz** will use the funds to seek development of substitutes for insulin in treatment of diabetes. The funds were willed to the Foundation by the late Eva Rhodes Freeman of Minneapolis. The grant for research purposes is the first ever given by the Foundation, according to **Dr. Herman E. Drill** of Hopkins, president. Four new trustees were elected to four-year terms on the Foundation board. They are **Dr. Corrin H. Hodgson**, Rochester; **Dr. Milton M. Hurwitz**, St. Paul; **Dr. Anderson C. Hilding**, Duluth; and **Dr. John A. Anderson**, St. Paul, who was also named to a one-year term as secretary-treasurer. Also re-elected to a four-year term was **Dr. Bernard Halper**, Hibbing.

* * *

Dr. Khalil G. Wakim, a member of the Section of Physiology of the Mayo Clinic, and professor of physiology in the Mayo Foundation, Graduate School, University of Minnesota, has been elected unanimously to honorary membership in the North Central Section of the American Urological Association, Inc.

* * *

Dr. Edgar V. Allen, internist of the Mayo Clinic and professor of medicine in the Mayo Foundation, Graduate School, University of Minnesota, received the Gold Heart Award of the American Heart As-



sociation at the annual dinner of the organization at the Bellevue-Stratford Hotel in Philadelphia on October 25. The award, described as "the highest honor within the gift of the association," was conferred upon Dr. Allen by unanimous selection of the committee on awards and the board of directors of the organization, in recognition of his "outstanding contributions in advancing the objectives and program of the American Heart Association."

* * *

Two Minneapolis physicians have been appointed to the medical staff of Doctors Memorial Hospital, according to announcement by Clarence R. Chaney, vice president of the board of directors. They are **Dr. L. E. Christensen,** ophthalmologist, and **Dr. Fred Bedford,** general practitioner, who recently returned after practicing in Montrose, Colorado. There are now seventy-seven doctors on the hospital's staff.

* * *

Dr. **Sumner Cohen,** Oak Terrace, was the principal speaker at a meeting of the St. Louis County Medical Society at St. Luke's Hospital in Duluth recently. Doctor Cohen spoke on the "Responsibility in Present-Day Tuberculosis Treatment and Control." The paper was the Third Annual Arthur T. Laird Lecture sponsored by the Tuberculosis and Health Association of St. Louis County.

St. Paul physician, **Dr. William R. Heilig,** has been elected as a Fellow of the American Academy of Pediatrics. The announcement came from the Academy's international office at Evanston, Illinois.

* * *

A key speaker at the Michigan Rehabilitation Conference held recently at Traverse City, Michigan, was **Dr. Miland E. Knapp,** Minneapolis. Doctor Knapp spoke on "Research in Rehabilitation." He also participated on a panel discussion on poliomyelitis research.

* * *

Stearns County Board of Commissioners recently named **Dr. S. H. Koop,** St. Cloud, as County Coroner, to serve the remainder of the term of the late Dr. Karl A. Walfred. The term will expire in 1962.

* * *

Dr. Frederic J. Kottke, Minneapolis, has been named President of the American Congress of Physical Medicine and Rehabilitation.

* * *

The postgraduate course in pediatrics under the sponsorship of the Chicago Medical Society was attended by **Dr. R. P. Groschupf,** a member of the Bemidji Clinic.

The Mindaman Orthopedic Society has elected **Dr. E. T. Evans,** Minneapolis, as President for the coming year.

* * *

Drs. Albert Schroeder, Hreidar Agustsson and **Detlof Olson** have announced the appointment of **Dr. C. Sherman Hoyt,** to their practice of pediatrics in Minneapolis.

* * *

Dr. John D. Hagen, of the Austin Clinic, recently attended a postgraduate course at the University of Kansas, Kansas City, Kansas. The theme of the course was Cardiology or the Study of the Heart and Blood Circulation throughout the Body.

* * *

Participating in an advanced seminar in dermatology was **Dr. Henry E. Michelson** of Minneapolis.

* * *

Speakers at the Fall Seminar of the Range Chapter of the American Academy of General Practice in Hibbing included: **Dr. Neil Palm,** St. Paul, surgeon; **Dr. Harold Ravits,** St. Paul, dermatologist; and **Dr. Tague Chisholm,** Minneapolis, pediatric surgeon.

* * *

Dr. William Byrne, who has been engaged in the practice of general medicine in Chisholm, Minnesota, the past two years, is now associated in practice with **Dr. Ernest Sowada** in Minneapolis. He has been in his present location since August 15, 1959.

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The Ramsey County Medical Society recently elected its 1960 officers. **Dr. Walter P. Gardner,** St. Paul, was elected president, to succeed **Dr. Gordon Kamman.** Other officers elected were **Dr. Charles C. Cooper,** president-elect for 1961; **Dr. Abbott Skinner,** secretary-treasurer, and **Dr. Joseph M. Ryan,** vice president.

* * *

Twenty-nine fellows of the Mayo Foundation have completed their fellowships or terminated their periods of assignment recently. They include: **Drs. B. R. Aigner, L. W. Blakey, J. R. Calverley, J. P. Glathe, R. A. Kyle, R. L. Larson, K. F. Niehaus, F. E. Roberts, J. C. Schaefer, J. E. Seay, III, R. B. Webb, Jr.,** and **R. J. White.**

* * *

Dr. Mario Fischer, Duluth, recently returned from the 15th Biennial Conference of International Union against Tuberculosis. The meeting of some 1,400 physicians from sixty-three countries was held in Istanbul.

* * *

Former Ellendale physician, **Dr. Morton O. Roan** and his wife, were recently injured in a fire in their Minneapolis apartment. The couple was not injured seriously.

* * *

Professor C. F. W. Illingworth, department of surgery, Western Infirmary, Glasgow, Scotland, gave a lecture on "Choice of Treatment and Prognostic Implications in the Endocrine Approach to Breast Cancer" at the Mayo Clinic, Rochester, Minnesota, on November 19, 1959.

* * *

Dr. John S. Lundy, formerly of the Mayo Clinic staff, left recently for Chicago where he will be associated with the Veterans Research Hospital and a private practice of anesthesiology.

* * *

Dr. Herbert W. Schmidt, Rochester, who was recently elected president of the Mayo Clinic staff, resigned that position when he was elected to the Board of Governors of the staff for a six-year term. **Dr. C. A. Owen, Jr.,** who was elected vice president, will become president of the Mayo Clinic staff. Other officers elected were **Dr. L. O. Underdahl,** secretary, and **Dr. A. M. Olsen,** and **Dr. D. W. Mulder,** councilors.

* * *

Dr. Walter C. Alvarez, Chicago, Illinois, former staff member at Mayo Clinic and emeritus professor of medicine, Mayo Foundation, was presented an award on December 3 by the New York City chapter of the American Medical Writers' Association for distinguished service in the improvement of medical communication. Ceremonies took place at the New York University School of Dentistry in Manhattan.

Doctor Alvarez, former editor of *GP,* is presently editor of *Geriatrics* and editor-in-chief of *Modern Medicine.*

* * *

Dr. Albert Schroeder and **Dr. Hreidar Agustsson,** Minneapolis, presented pediatric subjects on the program of the Camp Release Medical Society at the meeting held in Montevideo in November.

Book Reviews

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

THE FOOT AND ANKLE. Philip Lewin, M.D., F.A.C.S., Professor Emeritus of Bone and Joint Surgery, and formerly Head of Department of the Northwestern University Medical School; Professor of Orthopaedic Surgery, Post-graduate Medical School of Cook County Hospital; Attending Orthopaedic Surgeon, Cook County Hospital; Senior Attending Orthopaedic Surgeon, Mechael Reese Hospital, Consulting Orthopaedic Surgeon, Municipal Contagious Disease Hospital, Chicago; Colonel, Medical Corps, Army of United States (retired). 612 pages. 339 illus. by Harold Laufman, M.D., Associate Professor of Surgery, Northwestern University Medical School. Price $14.00, cloth. St. Louis: C. V. Mosby Company, 1959.

SYMPOSIUM ON GLAUCOMA. William B. Clark, M.D., F.A.C.S., Editor; Diplomate, American Board of Ophthalmology, Tulane University School of Medicine, New Orleans, La.; Chairman, Advisory Council on Ophthalmology, American College of Surgeons; Member, American Ophthalmological Society; Member, American Academy of Ophthalmology and Otolaryngology, and Joe M. Carmichael, M.S.J., Associate Editor. 314 pages, 99 illus. Price $13.50, cloth. St. Louis: C. V. Mosby Company, 1959.

GRAY'S ANATOMY. Henry Gray, F.R.S., Late Fellow of the Royal College of Surgeons; Lecturer on Anatomy at St. George's Hospital Medical School, London. Edited by Charles Mayo Goss, M.D., Managing Editor of the Anatomical Record; Professor of Anatomy, Louisiana State University School of Medicine, New Orleans, Louisiana. 1458 pages. 1174 illus., primarily color. Price $17.50, cloth. Philadelphia, Pennsylvania: Lea & Febiger, 1959.

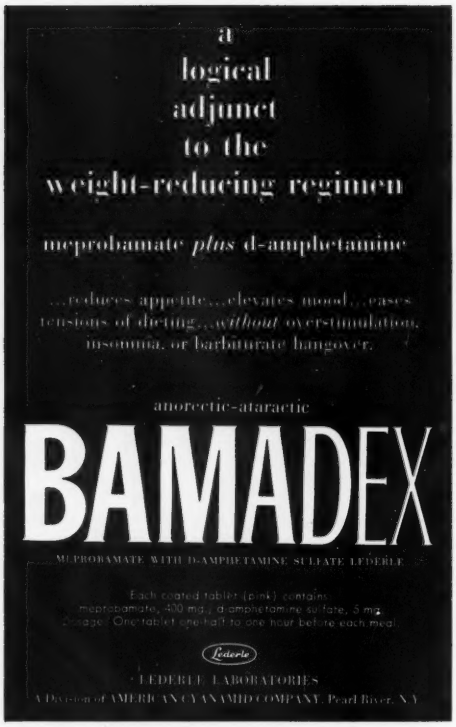
THE MODERN FAMILY HEALTH GUIDE. Edited by Morris Fishbein, formerly Editor of the *Journal of the American Medical Association*, Editor, *Excerpta Medica*, and Medical Editor of the *Britannica Book of the Year*. 1001 pages. Price $7.50, cloth. Garden City, New York: Doubleday and Company, 1959.

SURGERY OF THE FOOT. Henri L. DuVries, M.D., Clinical Instructor in Surgery, Chicago Medical School; Attending Surgeon, Columbus Hospital, Mother Cabrini Hospital, and Frank Cuneo Hospital; Chairman of the Department of Surgery, Illinois College of Chiropody and Foot Surgery, Chicago. 494 pages. Illus. Price $12.50, cloth. St. Louis: C. V. Mosby Company, 1959.

ANESTHESIA FOR INFANTS AND CHILDREN. Robert M. Smith, M.D., is Anesthesiologist at the Children's Medical Center, Boston, Massachusetts, Assistant Clinical Professor of Anesthesia, Harvard Medical School, Consultant in Anesthesia, U. S. Naval Hospital, Chelsea, Massachusetts and Lemuel



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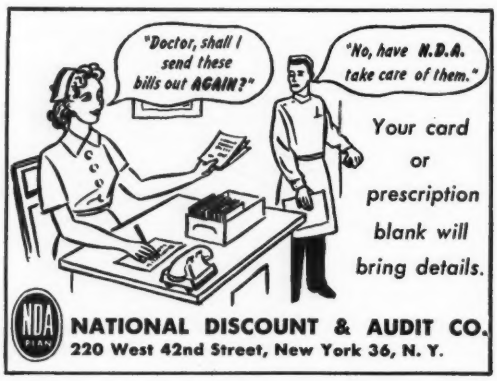
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Shattuck Hospital, Jamaica Plain, Massachusetts. 418 pages. Illus. Price $12.00, cloth. St. Louis: C. V. Mosby Company, 1959.

THE CARE OF MINOR HAND INJURIES. Adrian E. Flatt, M.S., M.D., F.R.C.S., Assistant Professor of Orthopedic Surgery, State University of Iowa, Iowa City, Iowa. 266 pages. Illus. Price $9.50, cloth. St. Louis: C. V. Mosby Company, 1959.

DIAGNOSTIC RADIOISOTOPES. Charles A. Owen, Jr., M.D., Ph.D. (Med.), Section of Clinical Pathology, Mayo Clinic, and Associate Professor of Clinical Pathology, Mayo Foundation Graduate School, University of Minnesota, Rochester, Minnesota. 425 pages. Illus. Price $15.75, cloth. Springfield, Illinois: Charles C Thomas, Publisher, 1959.

DIFFERENTIAL TREATMENT AND PROGNOSIS IN SCHIZOPHRENIA. Robert D. Wirt, Ph.D., Associate Professor of Psychology, University of Minnesota, Consultant, Psychiatry Service, Veterans Administration Hospital, Minneapolis, Minnesota, and Werner Simon, M.D., Chief, Psychiatry & Neurology Service, Veterans Administration Hospital, Minneapolis, Minnesota; Professor of Psychiatry, University of Minnesota. 198 pages. Price $6.50, cloth. Springfield, Illinois: Charles C Thomas, Publisher, 1959.

TRIFLUOPERAZINE. FURTHER CLINICAL AND LABORATORY STUDIES. John H. Moyer, M.D., Professor of Medicine and Chairman of the Department of Internal Medicine, Hahnemann Medical College, Philadelphia, Pennsylvania. 191 pages. 15 tables. Price $3.50, cloth. Philadelphia, Pennsylvania: Lea & Febiger, 1959.

SYNOPSIS OF EAR, NOSE AND THROAT DISEASES. Robert E. Ryan, B.S., M.D., M.S. (ALR), F.A.C.S., from the Department of Ootolaryngology, St. Louis University School of Medicine; Associate Otolaryngologist, St. John's Hospital, St. Louis; Assistant Otolaryngologist, Cardinal Glennon Hospital for Children and St. Louis University Group of Hospitals, St. Louis; Diplomate, American Board of Otolaryngology; Former Fellow of Mayo Clinic, Rochester, Minnesota, William C. Thornell, A.B., B.M., M.D., M.S. (ALR), F.A.C.S., Assistant Professor, Department of Otolaryngology, Cincinnati College of Medicine, University of Cincinnati; Staff Member of the Cincinnati General Hospital, Good Samaritan Hospital, Deaconess Hospital, St. Francis Hospital, and St. Mary's Hospital, Cincinnati; Diplomate, American Board of Otolaryngology; Former Fellow and Member of the Staff of Mayo Clinic, Rochester, Minnesota, and Hans von Leden, M.D., F.A.C.S., F.I.C.S., Assistant Professor of Otolaryngology, Northwestern University Medical School, Chicago; Associate Professor of Otolaryngology, Cook County Graduate School of Medicine, Chicago; Medical Director, The William and Harriet Gould Foundation, Chicago; Attending Otolaryngologist, Chicago Wesley Memorial Hospital and Cook County Hospital, Chicago, and St. Francis Hospital, Evanston, Illinois; Consultant in Otolaryngology, United States Naval Hospital, Great Lakes, Illinois; Diplomate, American Board of Otolaryngology; Former Fellow of Mayo Clinic, Rochester, Minnesota. 383 pages. Illus. Price $6.75, cloth. St. Louis: C. V. Mosby Company, 1959.

SYNOPSIS OF TREATMENT OF ANORECTAL DISEASES. Stuart T. Ross, M.D., F.A.C.S., F.I.C.S., Diplomate of the American Board of Proctology;



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Secretary of the American Board of Proctology; Fellow and Past President of the American Proctologic Society; Fellow of the New York Proctologic Society; Fellow of the Pennsylvania Proctologic Society; Honorary Fellow of the New Jersey Proctologic Society; Corresponding Member of Sociedad Brasileira de Proctologia. 240 pages. Illus. Price $6.50, cloth. St. Louis: C. V. Mosby Company, 1959.

SYNOPSIS OF OPHTHALMOLOGY. William H. Havener, B.A., M.D., M.S. (Ophth.), Professor and Chairman of the Department of Ophthalmology, Ohio State University, Member, Attending Staff, University Hospital, Columbus, Ohio, Consultant, Veterans Hospital, Dayton, Ohio, Member, Consulting Staff, Children's Hospital and Mt. Carmel Hospital, Columbus, Ohio. 288 pages. Illus. Price $6.75, cloth. St. Louis: C. V. Mosby Company, 1959.

SYNOPSIS OF GYNECOLOGY. 5TH EDITION. Robert James Crossen, M.D., Associate Professor of Clinical Gynecology and Obstetrics, Washington University School of Medicine, St. Louis, Missouri; formerly Associate Gynecologist and Obstetrician to Barnes Hospital and St. Louis Maternity Hospital and Gynecologist to St. Luke's Hospital, St. Louis, Missouri; Founding Fellow of the American College of Obstetricians and Gynecologists; Fellow of the American College of Surgeons and the Central Association of Obstetricians and Gynecologists; Member of the American Radium Society and the American Society for the Study of Sterility. Daniel Winston Beacham, M.D., Assistant Professor of Clinical Obstetrics and Gynecology, Tulane University School of Medicine, New Orleans, La.; Senior Visiting Surgeon, Charity Hospital of Louisiana at New Orleans; Obstetrician and Gynecologist, Southern Baptist Hospital and Hotel Dieu Hospital, New Orleans, La.; Fellow of the American College of Obstetricians and Gynecologists and American College of Surgeons; Member of the Central Association of Obstetricians and Gynecologists. Woodard Davis Beacham, M.D., Professor of Clinical Obstetrics and Gynecology, Tulane University School of Medicine, New Orleans, La.; Senior Visiting Surgeon, Charity Hospital of Louisiana at New Orleans; Obstetrician and Gynecologist, Southern Baptist Hospital and Hotel and Hotel Dieu Hospital, New Orleans, La.; First President of the American College of Obstetricians and Gynecologists; Fellow of the American Gynecological Society, the American College of Surgeons, and the American Association of Obstetricians and Gynecologists; Member of the Central Association of Obstetricians and Gynecologists. 340 pages. Illus. Price $6.50, cloth. St. Louis: C. V. Mosby Company, 1959.

YOU CAN NOW BREAK THE CIGARETTE HABIT. Arthur King. 96 pages. Price $2.00, cloth. Garden City, New York: Doubleday & Company, 1959.

MASTER YOUR TENSIONS AND ENJOY LIVING AGAIN. George S. Stevenson, M.D., National and Internation Consultant, National Association for Mental Health, and Harry Milt, Public Relations Director, National Association for Mental Health. 241 pages. Price $4.95, hard cover. Englewood, New Jersey: Prentice-Hall, Inc., 1959.

LIVING BEYOND YOUR HEART ATTACK. Eugene B. Mozes, M.D., 212 pages. Price $3.50, cloth. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1959.

Classified Advertising

Replies to advertisements with key numbers should be mailed in care of MINNESOTA MEDICINE, *2642 University Avenue, Saint Paul 14, Minnesota.*

M.D., University of Minnesota '57, age 27, desires association with G.P. or group in Minneapolis or suburban areas upon completion of military obligation in July, 1960. Address E-696, care MINNESOTA MEDICINE.

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WANTED—Physician aged 25-40 with some Pediatric training to join established four-man group in city of 5,000 within Twin City metropolitan area. Please write to E-692, care MINNESOTA MEDICINE.

PHYSICIAN WANTED—Young, general practitioner interested in obstetrics and pediatrics to join 4-man suburban group. Address E-695, care MINNESOTA MEDICINE.

GENERALIST WANTED—Two general practitioners in Northern Minnesota desire association. Good office, hospital and school facilities. Salary open. Partnership later. Write E-674, care MINNESOTA MEDICINE.

WANTED—Associate in General Practice in Saint Paul. Beginning salary, $10,000, with opportunity for partnership. Address E-663, care MINNESOTA MEDICINE.

WANTED—Community of 1500 in southern Minnesota wants Medical Doctor immediately! Modern building, equipment, and drugs available from vacated practice. If interested, please contact Chamber Commerce, Box 267, Janesville, Minnesota, or Dr. M. C. Florine, Gorgas Hospital, Canal Zone.

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ASSISTANT MEDICAL DIRECTOR—Insurance Company Upper Midwest. Training in Internal Medicine preferred, age under 40. Fringe benefits and excellent working conditions. Work consists of underwriting, interpreting x-rays and electrocardiograms, industrial medicine and some administration. Starting salary based on qualifications. Submit background information, professional and personal, to Box E-706, care MINNESOTA MEDICINE.

WANTED—Young doctor to associate with group in capacity of assistant in the Surgical Department. Liberal salary arrangement. Position now open. Address E-707, care MINNESOTA MEDICINE.

FOR SALE—2-year-old Burroughs Sensimatic Series 50 bookkeeping machine and equipment. 50 per cent off purchase price. Broadway Clinic, 710 West Broadway, Minneapolis 11, Minnesota.

WANTED—Young general practitioner for association with small suburban Saint Paul group. Salary and early partnership. Address E-698, care MINNESOTA MEDICINE.

FOR SALE—Well-equipped office in small town near Minneapolis. Gross income $2500 monthly. New hospital in town. Very reasonable terms. Reason: gradual retirement. Address E-704, care MINNESOTA MEDICINE.

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Minnesota Medicine



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Dec., 1959, V. 42, No. 12

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Robert A. Maslansky
Riley D. Woodson
Leslie Zieve

- Diarrhea of American Travelers Abroad
- Billroth I
- Juvenile Rheumatoid Arthritis
- Ectopic Pregnancy
- Tuberculosis in Children
- Auto-immunity—Thyroid Diseases

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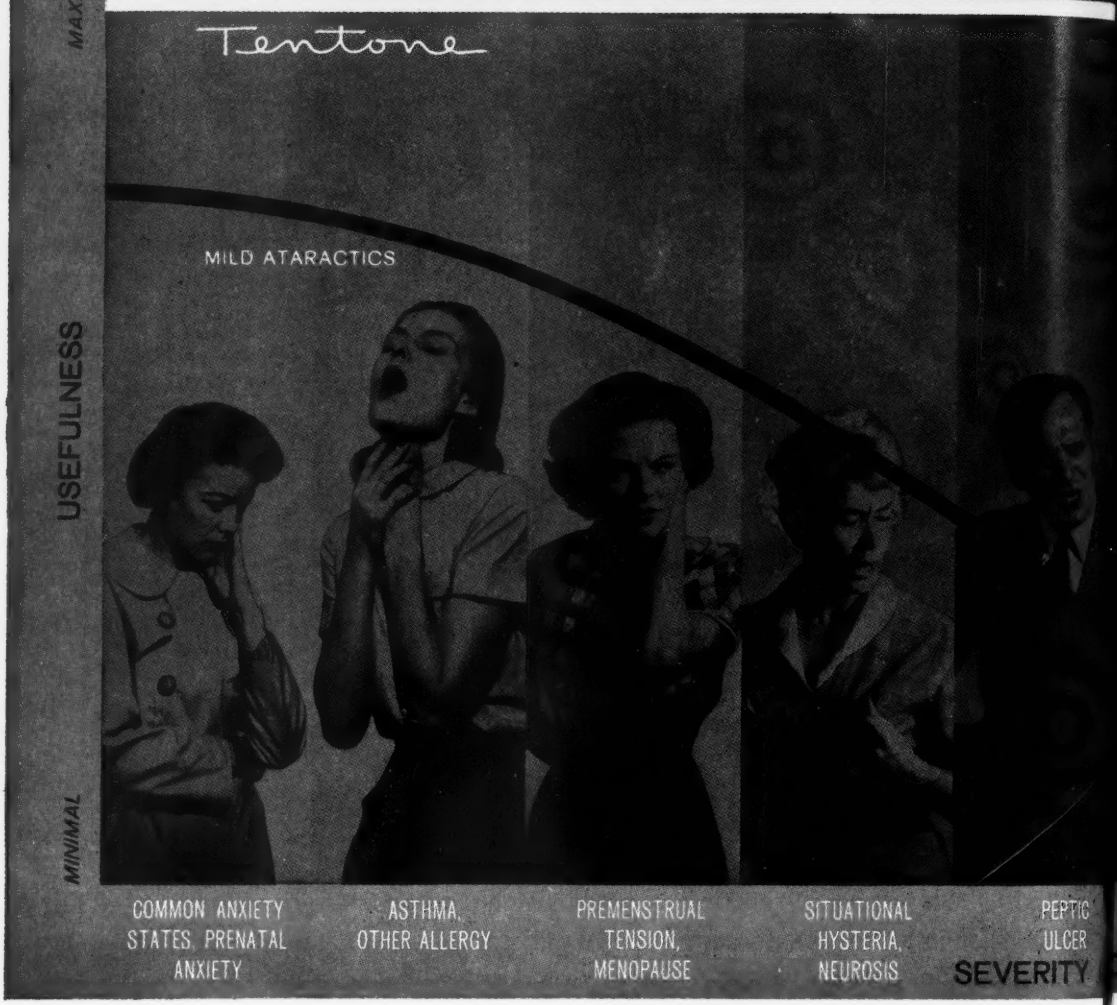
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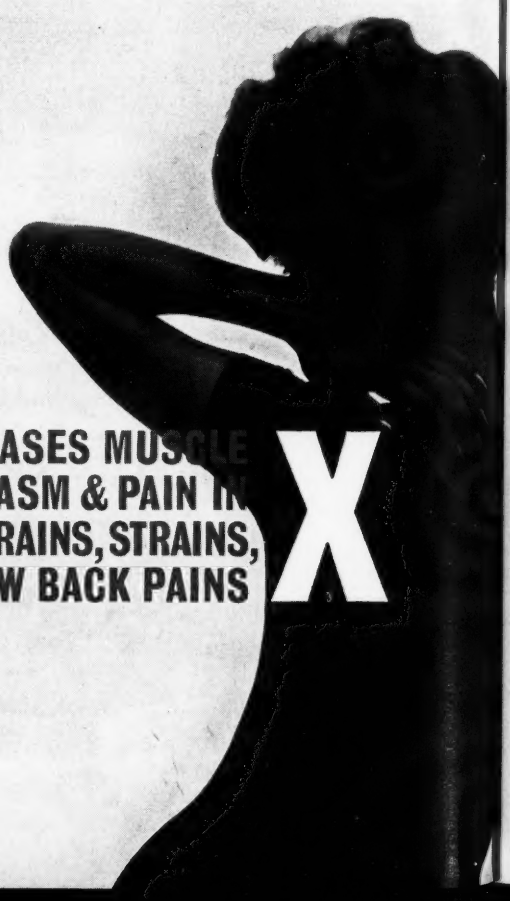
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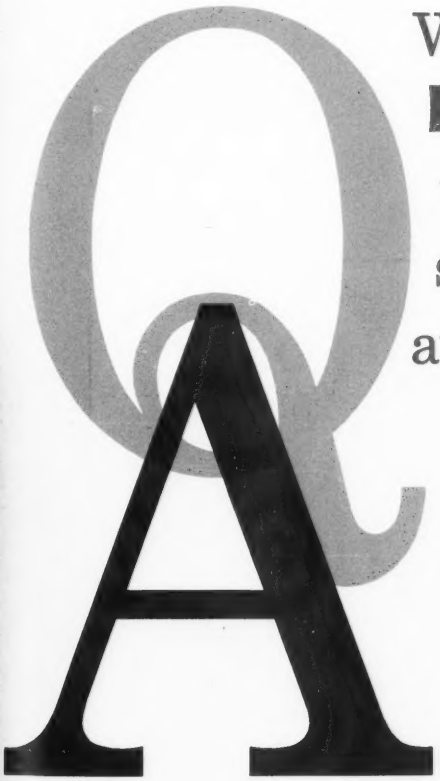
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Because KANTREX Injection is bactericidal to a wide variety of organisms, including many that are highly resistant to the other antibiotics[3,4,10,12,13,17,18,20,21,23,24,25,27,30,33,35,37]

—organisms such as *Staph. aureus, Staph. albus, A. aerogenes, E. coli, H. pertussis, K. pneumoniae, Neisseria* sp., *Shigella, Salmonella* and many strains of *B. proteus.*

Q *But if I use* KANTREX *Injection, won't that help make bacteria resistant to it also?*

Next page, please .....

*Kanamycin sulfate injection (Bristol)

Q *But if I use* KANTREX *Injection, won't that help make bacteria resistant to it also?*

A A very good question, but it is reassuring to note that in almost two years of clinical use of KANTREX for the treatment of infections for which it is recommended, the emergence of KANTREX-resistant bacterial populations has not been a problem.

Q *My impression is that* KANTREX *is just another neomycin. Isn't that so?*

A Indeed not. The only thing KANTREX and neomycin have in common is a similar antimicrobial spectrum. Otherwise, they're very different: they have different chemical structures; the toxicity of KANTREX is "much less than that of neomycin"[14]; and clinically, KANTREX Injection is practical for systemic administration routinely, while neomycin is not.

Q *You mean that* KANTREX *Injection doesn't have the nephrotoxicity of neomycin?*

A Precisely. It's true that when KANTREX Injection is used, urinary casts – even slight albuminuria or microscopic hematuria – may appear, especially in poorly hydrated patients, but this does not reflect any progressive damage to the kidneys. These signs promptly disappear on adequate hydration or termination of therapy.

Q *Then why do you recommend reduced dosage in patients with renal impairment?*

A Because renal impairment causes an excessive accumulation of KANTREX in the blood and tissues, when usual doses are administered. Since KANTREX Injection is excreted entirely by the kidneys, renal impairment leads



to unnecessarily high and prolonged blood levels; and such excessive concentrations increase the risk of ototoxicity.

Q *Is that why we see reports of patients developing hearing loss during* KANTREX *Injection therapy?*

A Yes. A study of the few reported cases in which patients have suffered impaired hearing will show that in every instance they had pre-existing or concurrent renal impairment, yet received usual or excessive doses of KANTREX Injection. Dosage recommendations for KANTREX Injection emphasize that in patients with renal dysfunction, adequate serum levels can be achieved with a fraction of the dose suggested for patients with normal kidney function – with minimal risk of ototoxicity.

Q *Since urinary tract infections are often accompanied by renal impairment, does that mean I shouldn't use* KANTREX *Injection in such conditions?*

A Not at all. With proper precautions, KANTREX Injection is an excellent drug for the treatment of urinary tract infections, especially those due to *Proteus*, *A. aerogenes* and *E. coli*, even when renal impairment is present.

Q *What are the "proper precautions" in a patient with impaired renal function?*

A The package literature covers them in detail. First, the daily dose should be reduced in such a patient. Then, if he is going to receive KANTREX Injection for 7 days or more, a pre-treatment audiogram should be done, and it should be repeated at appropriate intervals during therapy. If tinnitus or subjective hearing loss develops, or if followup audiograms show significant loss of high frequency response, KANTREX therapy should be discontinued. However, therapy for 7 days or more

is seldom required because the clinical response to KANTREX Injection is so rapid.

Q *Why do you put so much emphasis on* KANTREX'S *"rapid action"? Every antibiotic I've heard about is supposed to be "rapid acting."*

A There is such an abundance of clinical evidence about "rapid acting" that it takes KANTREX Injection out of the "supposed-to" class.[1,2,3,7,8,9,11,15,16,19,21,22,26,29,32,33] Remember, the effectiveness of KANTREX Injection therapy can usually be appraised in 24 to 36 hours. That's definite evidence of rapid action. In fact, one group of investigators reported that "the rapidity with which bacteria are killed by this agent is reflected by the promptness of the clinical response."[29]

Q *Does* KANTREX *Injection cause blood dyscrasias?*

A In extensive clinical and toxicity studies by numerous investigators, as well as almost two years of general use, not a single instance of such toxicity has been reported.

Q *Can I administer* KANTREX *Injection in any other way than by the intramuscular route?*

A Yes. While it's usually given intramuscularly, other routes are practicable: intravenous, intraperitoneal, by aerosol, and as an irrigating solution. Complete instructions are included in the package insert.

Q *So you think I ought to use* KANTREX *Injection as my first choice antibiotic in staph and gram-negative infections?*

A Yes – because all evidence to date indicates that it is bactericidal against a wide range of organisms...rapid acting...does not encourage development of bacterial resistance...is well tolerated in specified dosage...and has not caused any blood dyscrasias.

KANTREX® CAPSULES

for local gastrointestinal therapy... not for systemic infections

Q *Why can't I use* KANTREX *Capsules for systemic medication?*

A Because there is only negligible absorption of KANTREX from the gastrointestinal tract.[3,5,6,8,28,34] Thus, capsules cannot provide effective blood levels.

Q *Then what are* KANTREX *Capsules used for?*

A Preoperative bowel sterilization, and local treatment of intestinal infections due to kanamycin-sensitive organisms.

Q *I've been using neomycin for preoperative bowel sterilization. Why should I switch to* KANTREX *Capsules?*

A Because KANTREX has been rated as "superior to neomycin" for this purpose.[6] It provides rapid and satisfactory control of coliforms, clostridia, staphylococci and streptococci; yeasts do not proliferate; stool concentrations of the drug are exceptionally high; and nausea, vomiting or intestinal irritation have not been observed.[5,6]

Q *What advantages do* KANTREX *Capsules offer me in the treatment of intestinal infections?*

A A high degree of effectiveness against most of the pathogens responsible for such infections: *Salmonella, Shigella, Staph. aureus, E. coli* and *Endamoeba histolytica.* Moreover, their use has been "remarkably free of any side effects."[31]

KANTREX®

INJECTION KANAMYCIN SULFATE INJECTION

INDICATIONS

Infections due to kanamycin-sensitive organisms, particularly staph or "gram-negatives": genito-urinary infections; skin, soft tissue and post-surgical infections; respiratory tract infections; septicemia and bacteremia; osteomyelitis and periostitis.

DOSAGE: INTRAMUSCULAR ROUTE

Recommended daily dose is 15 mg. per kg. of body weight, in 2 to 4 divided doses.

For intramuscular administration, KANTREX Injection should be injected deeply into the upper outer quadrant of the gluteal muscle.

TOXICITY

When the recommended precautions are followed, the incidence of toxic reactions to KANTREX is low. In well hydrated patients under 45 years of age with normal kidney function, receiving a total dose of 20 Gm. or less of KANTREX, the risk of ototoxic reactions is negligible.

In patients with renal disease and impaired renal function, the daily dose of KANTREX should be reduced in proportion to the degree of impairment to avoid accumulation of the drug in serum and tissues, thus minimizing the possibility of ototoxicity. In such patients, if therapy is expected to last 7 days or more, audiograms should be obtained prior to and during treatment. KANTREX therapy should be stopped if tinnitus or subjective hearing loss develops, or if audiograms show significant loss of high frequency response.

OTHER ROUTES OF ADMINISTRATION

KANTREX should be used by intravenous infusion only when the intramuscular route is impracticable. KANTREX can also be employed for intraperitoneal use, aerosol treatment, and as an irrigating solution. See package insert for directions.

PRECAUTIONS

Use of antibiotics may occasionally result in overgrowth of non-sensitive organisms. If superinfection appears during therapy, appropriate measures should be taken.

SUPPLY

Available in rubber-capped vials as a ready-to-use sterile aqueous solution in two concentrations (stable at room temperature indefinitely):

KANTREX Injection, 0.5 Gm. kanamycin (as sulfate) in 2 ml. volume.
KANTREX Injection, 1.0 Gm. kanamycin (as sulfate) in 3 ml. volume.

CAPSULES (for local gastrointestinal therapy; not for systemic medication)

INDICATIONS AND DOSAGE

For preoperative bowel sterilization: 1.0 Gm. (2 capsules) every hour for 4 hours, followed by 1.0 Gm. (2 capsules) every 6 hours for 36 to 72 hours.

For intestinal infections: Adults: 3.0 to 4.0 Gm. (6 to 8 capsules) per day in divided doses for 5 to 7 days. Infants and children: 50 mg. per kg. per day in 4 to 6 divided doses for 5 to 7 days.

PRECAUTION

Preoperative use of KANTREX Capsules is contraindicated in the presence of intestinal obstruction. Although only negligible amounts of KANTREX are absorbed through intact intestinal mucosa, the possibility of increased absorption from ulcerated or denuded areas should be considered.

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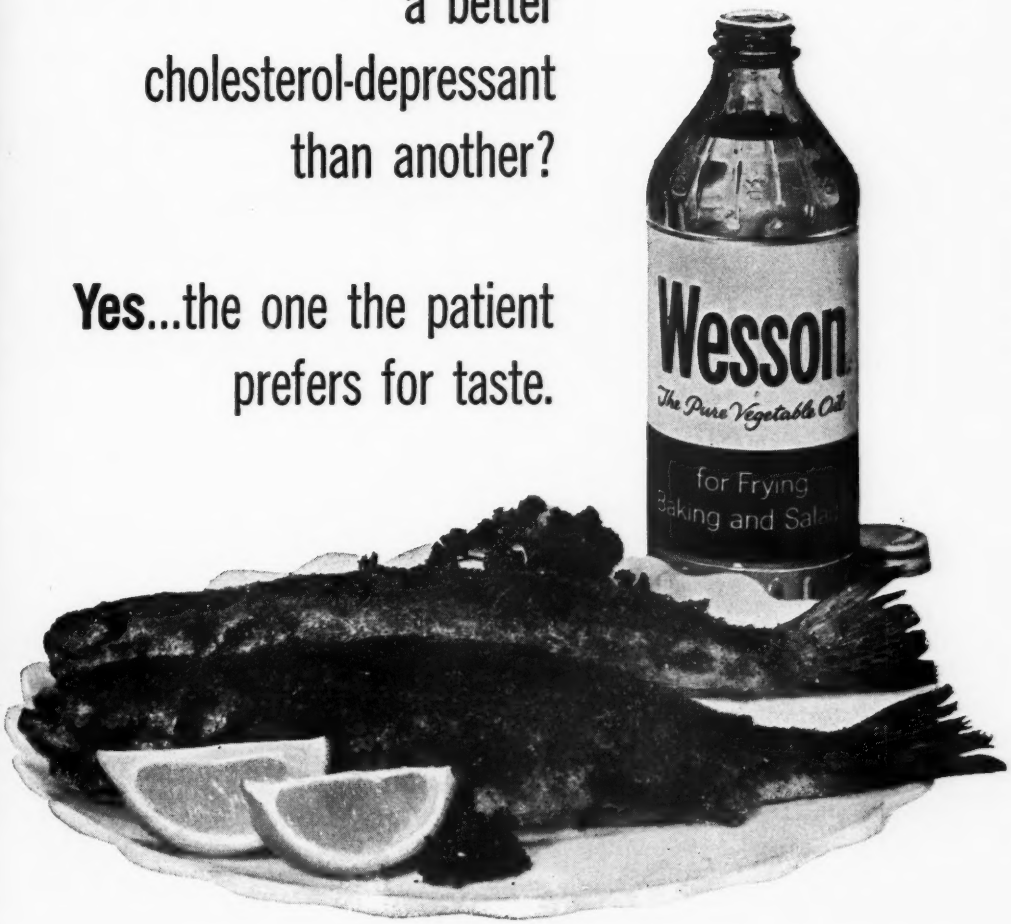
REFERENCES:

1. Andrieu, G., Monnier, J., and Bourse, R.: Presse Med. 67:718, 1959. 2. Berger, S. H., and Wehrle, P. F.: Ann. N. Y. Acad. Sci. 76:136, 1958. 3. Bunn, P. A., Baltch, A., and Krajnyak, O.: *Ibid.* 76:109, 1958. 4. Bunn, P. A., and Baltch, A.: New Eng. J. Med. 259:659, 1958. 5. Cohn, I., Jr., and Longacre, A. B.: S. G. & O. 108:100, 1959. 6. Cohn, I., Jr.: Ann. N. Y. Acad. Sci. 76:212, 1958. 7. Cronk, G. A., and Naumann, D. E.: *Ibid.* 76:308, 1958. 8. Cronk, G. A., and Naumann, D. E.: J. Lab. & Clin. Med. 53:888, 1959. 9. Davies, F. G.: Ann. N. Y. Acad. Sci. 76:129, 1958. 10. Dougherty, L. J., Seneca, H., and Lattimer, J. K.: Antibiotics Annual 1958-1959, p. 713. 11. Dube, A. H.: Am. Pract. & Digest Treat. 10:1165, 1959. 12. Finegold, S. M., *et al.*: Antibiotics Annual 1958-1959, p. 606. 13. Finegold, S. M., *et al.*: Ann. N. Y. Acad. Sci. 76:319, 1958. 14. Finland, M.: *Ibid.* 76:391, 1958. 15. Finland, M.: Lancet 2:209, 1958. 16. Fujii, R., *et al.*: J. Japan M. A. 39:740, 1958; abst. World-Wide Abst. Gen. Med. 2:28, 1959. 17. Gourevitch, A., Hunt, G. A., and Lein, J.: Ant. & Chemo. 8:149, 1958. 18. Gourevitch, A., *et al.*: Ann. N. Y. Acad. Sci. 76:31, 1958. 19. Greey, P. H., and Wightman, K. J. R.: *Ibid.* 76:224, 1958. 20. Griffith, L. J., and Ostrander, W. E.: Ant. & Chemo. 9:416, 1959. 21. Hewitt, W. L., and Finegold, S. M.: Ann. N. Y. Acad. Sci. 76:122, 1958. 22. High, R. H., Sarria, A., and Huang, N. N.: *Ibid.* 76:289, 1958. 23. Hirsh, H. L.: Sibley Mem. Hosp. Alumni Assn. Bull. 2:16, 1959. 24. Hunt, G. A., and Moses, A. J.: Ann. N. Y. Acad. Sci. 76:81, 1958. 25. Lattimer, J. K., Seneca, H., Zinsser, H. H. and Troc, O.: J.A.M.A. 170:938, 1959. 26. Prigot, A., Shidlovsky, B. A., and Campbell, E. A.: Ann. N. Y. Acad. Sci. 76:204, 1958. 27. Riley, H. D., Jr.: Antibiotics Annual 1958-1959, p. 623. 28. Ruiz Sanchez, F., *et al.*: *Ibid.*, p. 725. 29. Rutenburg, A. M., Koota, G. M., and Schweinburg, F. B.: Ann. N. Y. Acad. Sci. 76:348, 1958. 30. Slotkin, E. A.: Postgrad. Med. 25:433, 1959. 31. Thurman, W. G., and Platou, R. V.: Ann. N. Y. Acad. Sci. 76:230, 1959. 32. Welch. H., *et al.*: *Ibid.* 76:66, 1958. 33. White, A., and Knight, V.: *Ibid.* 76:277, 1958. 34. Yow, E. M.: Practitioner. 182:759, 1959. 35. Yow, E. M., *et al.*: A.M.A. Arch. Int. Med. 102:948, 1958. 36. Yow, M. D., Desmond, M. M., and Nickey, L. N.: J. Ped. 54:409, 1959. 37. Yow, M. D., and Womack, G. K.: Ann. N. Y. Acad. Sci. 76:363, 1958.

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SYMPOSIUM REPORT:

ALTAFUR in antibiotic-resistant staphylococcal infections

ALTAFUR proved superior to any other single agent against staphylococcal infections encountered in the pediatric section of a general hospital. Introduced during an epidemic of severe staphylococcal pneumonia and bronchiolitis in younger children, ALTAFUR was employed in treating a total of 59 infants or juvenile patients, most of whom had upper or lower respiratory tract involvement. Almost all had been given antibiotics without effect; 34 were judged severely or critically ill. Cures were obtained in 54 of these patients after a 3 to 10 day course of ALTAFUR. There was only one failure (results were inconclusive in the remaining four cases). Mixed infections with Pneumococcus or Streptococcus sp. also responded readily.

ALTAFUR was administered orally in varying dosage: the optimal dose is believed to be about 22 mg./Kg. daily.

Side effects were minimal in these patients, being limited to gastric intolerance in a few cases, usually controllable by giving the drug with or after meals. Laboratory studies performed before and after ALTAFUR treatment revealed no adverse influence on renal, hepatic or hematopoietic function, nor other signs of toxicity.

In vitro, staphylococci isolated in this series proved uniformly susceptible to ALTAFUR, whereas many strains were resistant to a variety of antibotics. With ALTAFUR as with all nitrofurans, the lack of development of significant bacterial resistance is considered a major advantage over other antimicrobials.

Lysaught, J. N., and Cleaver, W.: Paper presented at the Symposium on Antibacterial Therapy, Michigan and Wayne County Academies of General Practice, Detroit, Sept. 12, 1959 (published Nov., 1959)

bright new star

in the antibacterial firmament

ALTAFUR T.M.

brand of furaltadone

the first nitrofuran effective orally in systemic bacterial infections

- Antimicrobial range encompasses the majority of common infections seen in everyday office practice and in the hospital
- Decisive bactericidal action against staphylococci, streptococci, pneumococci, coliforms
- Sensitivity of staphylococci in vitro (including antibiotic-resistant strains) has approached 100%
- Development of significant bacterial resistance has not been encountered
- Low order of side effects
- Does not destroy normal intestinal flora nor encourage monilial overgrowth (little or no fecal excretion)

Tablets of 50 mg. (pediatric) and 250 mg. (adult)
Average adult dose: 250 mg. four times a day, with food or milk
Pediatric dosage: 22-25 mg./Kg. (10-11.5 mg./lb. body weight daily in 4 divided doses

CAUTION: The ingestion of alcohol in any form, medicinal or beverage, should be avoided during Altafur therapy.

NITROFURANS—a *unique* class of antimicrobials
EATON LABORATORIES, NORWICH, NEW YORK

ANNOUNCING SCHERING'S NEW MYOGESIC



RELA™ EASES STRAINS SPRAINS & LOW BACK PAINS...!

CARISOPRODOL



RELA—a new myogesic for better relaxant *and* analgesic therapy—more adept management of spasm and pain in strains, sprains and low back pains.

RELA—though a single drug—is a true myogesic and works rapidly to achieve three desired effects...

Rela relaxes acute muscle spasm
Relief of muscle spasm (96% excellent to good effectiveness)[1]

Rela provides a unique quality of persistent pain relief through its relaxant and analgesic actions
"Relief from pain was usually rapid and sometimes dramatic"[1]

Rela, through relaxation and analgesia, assures daytime ease and nighttime rest
"... A number of patients reported freedom from insomnia which they attributed to freedom from pain."[1]

indications: RELA is most beneficial in those conditions of the musculoskeletal system manifesting pain, stiffness and spasm.

safety: Studies of more than 1400 patients indicate that the toxicity of RELA is exceptionally low. In human subjects, respiratory, blood pressure or blood chemistry changes and/or renal, hepatic or endocrine dysfunction have not been reported.

dosage: The usual adult dosage of RELA is one tablet 3 times daily and at bedtime. RELA has a rapid onset of action, with relief usually apparent within 30 minutes, and persisting for at least 6 hours.

supply: RELA is available as 350 mg., pink, coated tablets in bottles of 30.

1. Kuge, T.: To be published.

H-227

MYOGESIC
muscle relaxant—analgesic

Schering

Lifts depression..s



An emotionally balanced patient
Thanks to your treatment and the help of Deprol, her depression is relieved and her anxiety and tension calmed. She eats well, sleeps well, and can return to her normal activities.

..s it calms anxiety!

eprol helps balance the mood y lifting depression as it alms related anxiety

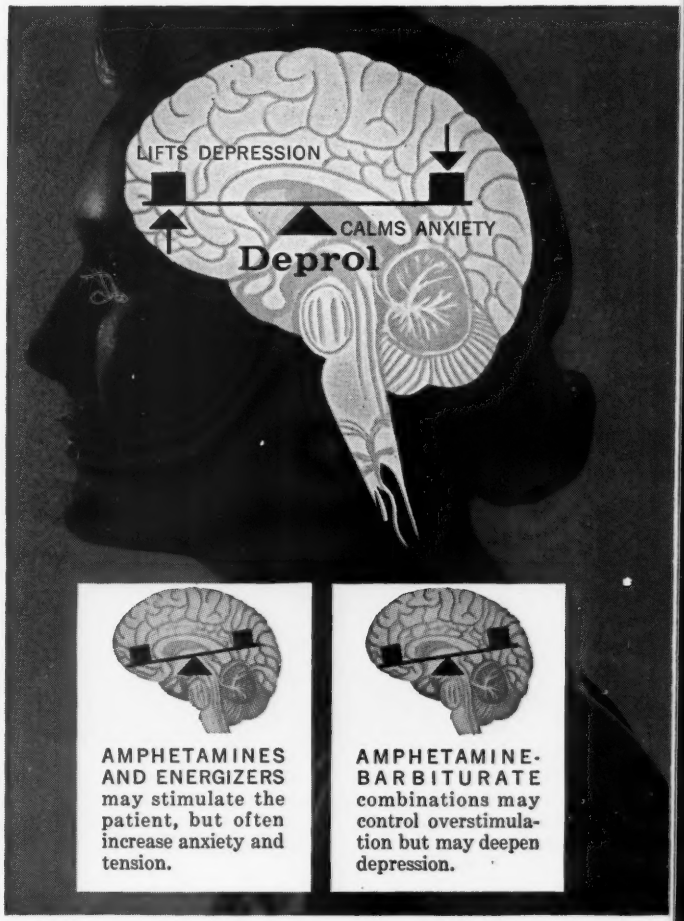
No "seesaw" effect of amphetamine-barbiturates and energizers

While amphetamines and energizers may stimulate the patient—*they often aggravate anxiety and tension.* And although amphetamine-barbiturate combinations may counteract excessive stimulation—*they often deepen depression.*

In contrast to such "seesaw" effects, Deprol lifts depression as it calms anxiety—both at the same time.

Safer choice of medication than untested drugs

Deprol does not produce hypotension, liver damage, psychotic reactions or changes in sexual function.



BIBLIOGRAPHY: **1.** Alexander, L.: Chemotherapy of depression—Use of meprobamate combined with benactyzine (2-diethylaminoethyl benzilate) hydrochloride. J.A.M.A. 166:1019, March 1, 1958. **2.** Bateman, J. C. and Carlton, H. N.: Deprol as adjunctive therapy for patients with advanced cancer. Antibiotic Med. & Clin. Therapy. In press, 1959. **3.** Bell, J. L., Tauber, H., Santy, A. and Pulito, F.: Treatment of depressive states in office practice. Dis. Nerv. System 20:263, June 1959. **4.** McClure, C. W., Papas, P. N., Speare, G. S., Palmer, E., Slattery, J. J., Konefal, S. H., Henken, B. S., Wood, C. A. and Ceresia, G. B.: Treatment of depression—New technics and therapy. Am. Pract. & Digest Treat. In press, 1959. **5.** Pennington, V. M.: Meprobamate-benactyzine (Deprol) in the treatment of chronic brain syndrome, schizophrenia and senility. J. Am. Geriatrics Soc. 7:656, Aug. 1959. **6.** Rickels, K. and Ewing, J. H.: Deprol in depressive conditions. Dis. Nerv. System 20:364, (Section One), Aug. 1959. **7.** Ruchwarger, A.: Use of Deprol (meprobamate combined with benactyzine hydrochloride) in the office treatment of depression. M. Ann. District of Columbia 28:438, Aug. 1959. **8.** Settel, E.: Treatment of depression in the elderly with a meprobamate-benactyzine hydrochloride combination. Antibiotic Med. & Clin. Therapy. In press, 1959.

Deprol®

DOSAGE: Usual starting dose is 1 tablet q.i.d. When necessary, this may be gradually increased up to 3 tablets q.i.d.

COMPOSITION: 1 mg. 2-diethylaminoethyl benzilate hydrochloride (benactyzine HCl) and 400 mg. meprobamate.

SUPPLIED: Bottles of 50 light-pink, scored tablets. Write for literature and samples.

WALLACE LABORATORIES / *New Brunswick, N. J.*

CD-154

Eyes Right!

the advantages of oil suspension

rapid even coverage on eye, lids, fornices . . . resists dilution by lacrimation . . . maintains effective antibiotic concentrations

the effectiveness of ACHROMYCIN

rapid suppression of common cocci and bacilli and of susceptible viruses—whether the primary infection or a complication of irritation, trauma, or inflammatory disease . . . fast resolution of swelling, erythema, and lesions . . . excellently tolerated

in the unique dropper-bottle

precise measurement of dose . . . clean . . . minimizes contamination . . . 4 cc. plastic squeeze dropper-bottle; 10 mg. (1%) ACHROMYCIN Tetracycline HCl per cc. sesame oil suspension



ACHROMYCIN®

Tetracycline Lederle

OPHTHALMIC OIL SUSPENSION 1%

Lederle LEDERLE LABORATORIES, A Division of AMERICAN CYANAMID COMPANY, Pearl River, N.Y.



for the tense and nervous patient

relief comes fast and comfortably

–does not produce autonomic side reactions
–does not impair mental efficiency, motor control, or normal behavior.

Usual Dosage: One or two 400 mg. tablets t.i.d.

Supplied: 400 mg. scored tablets, 200 mg. sugar-coated tablets or as MEPROTABS*–400 mg. *unmarked,* coated tablets.

Miltown®

meprobamate (Wallace)

WALLACE LABORATORIES / *New Brunswick, N. J.*

CM-9470

NOW

. . . a new way to relieve pain and stiffness in muscles and joints

indicated in:

MUSCLE STIFFNESS

LUMBOSACRAL STRAIN

SACROILIAC STRAIN

WHIPLASH INJURY

BURSITIS

SPRAINS

TENOSYNOVITIS

FIBROSITIS

FIBROMYOSITIS

LOW BACK PAIN

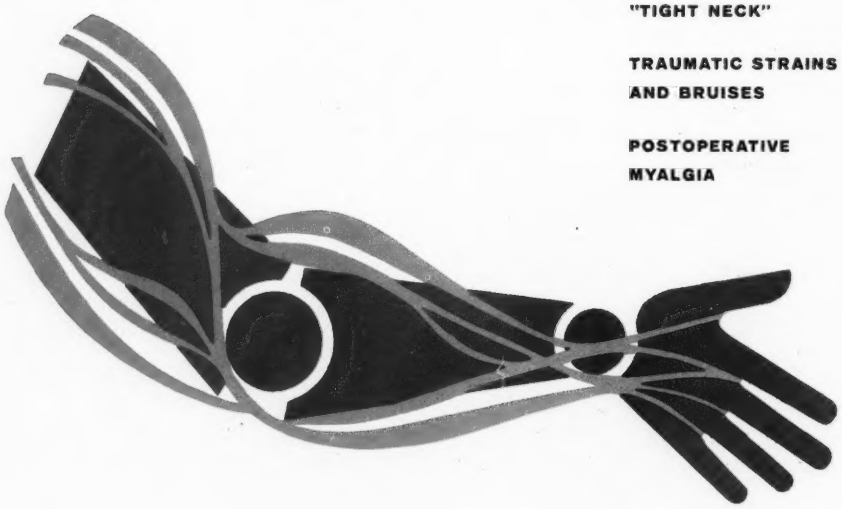
DISC SYNDROME

SPRAINED BACK

"TIGHT NECK"

TRAUMATIC STRAINS AND BRUISES

POSTOPERATIVE MYALGIA



■ Exhibits unusual analgesic properties, different from those of any other drug ■ Specific and superior in relief of SOMAtic pain ■ Modifies central perception of pain without abolishing natural defense reflexes ■ Relaxes abnormal tension of skeletal muscle

SOMA™

N-isopropyl-2-methyl-2-propyl-1, 3-propanediol dicarbamate

■ More specific than salicylates ■ Less drastic than steroids

■ More effective than muscle relaxants

SOMA has an unique analgesic action. It apparently modifies central pain perception without abolishing peripheral pain reflexes. SOMA is particularly effective in relieving joint pain. Patients say that they feel better and sleep better with SOMA than with previously used analgesic, sedative or relaxant drugs.
SOMA also relaxes muscle hypertonia, with its stresses on related joints, ligaments and skeletal structures.

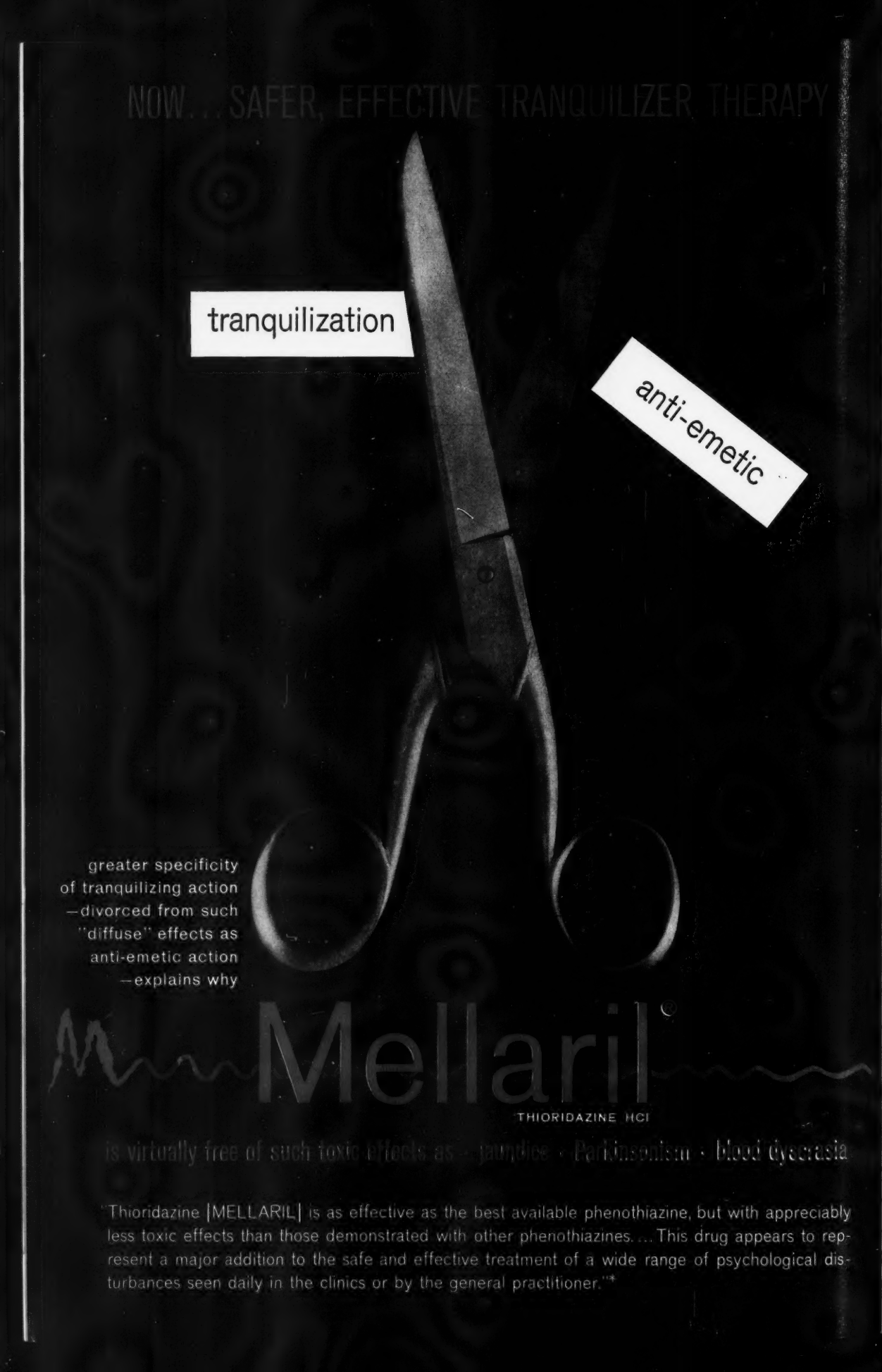
ACTS FAST. Pain-relieving and relaxant effects start in 30 minutes and last 6 hours.

NOTABLY SAFE. Toxicity of SOMA is extremely low. No effects on liver, endocrine system, blood pressure, blood picture or urine have been reported. Some patients may become sleepy, particularly on high dosage.

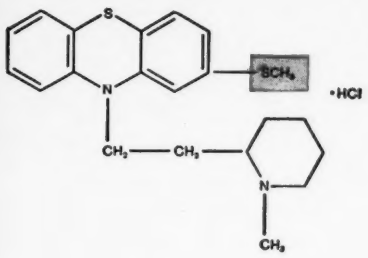
EASY TO USE. Usual adult dose is one 350 mg. tablet 3 times daily and at bedtime.

SUPPLIED: Bottles of 50 white coated 350 mg. tablets.
Literature and samples on request.

WALLACE LABORATORIES, NEW BRUNSWICK, N. J.

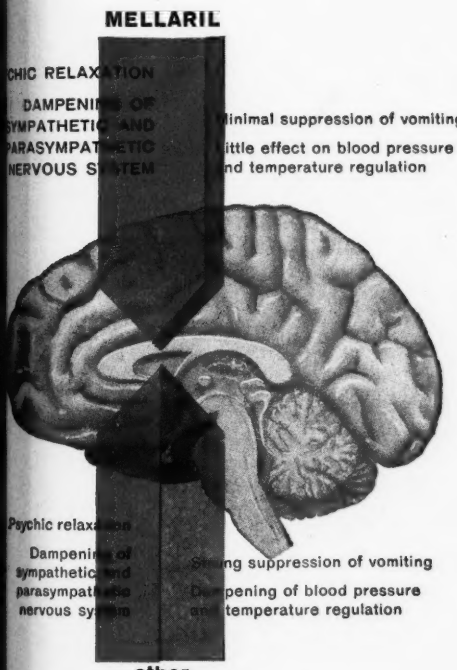

NOW... SAFER, EFFECTIVE TRANQUILIZER THERAPY
tranquilization
anti-emetic
greater specificity
of tranquilizing action
—divorced from such
"diffuse" effects as
anti-emetic action
—explains why
Mellaril®
THIORIDAZINE HCl
is virtually free of such toxic effects as · jaundice · Parkinsonism · blood dyscrasia
"Thioridazine [MELLARIL] is as effective as the best available phenothiazine, but with appreciably less toxic effects than those demonstrated with other phenothiazines. ... This drug appears to represent a major addition to the safe and effective treatment of a wide range of psychological disturbances seen daily in the clinics or by the general practitioner."*

new advance in tranquilization:
reater specificity of tranquilizing action results in fewer side effects



The presence of a thiomethyl radical (S-CH_3) is unique in Mellaril and could be responsible for the relative absence of side effects and greater specificity of psychotherapeutic action. This is shown clinically by:

1 A specificity of action on certain brain sites in contrast to the more generalized or "diffuse" action of other phenothiazines. This is evidenced by a lack of appreciable anti-emetic effect.





2 Less "spill-over" action to other brain areas — hence, absence of undue sedation, drowsiness or autonomic nervous system disturbances.

3 A notable absence of extrapyramidal stimulation.

4 Lack of impairment of patient's normal drive and energy.

5 Virtual freedom from such toxic effects as jaundice, photosensitivity, skin eruptions, blood forming disorders.

INDICATION	USUAL STARTING DOSE	TOTAL DAILY DOSAGE RANGE
ADULTS: Mental and Emotional Disturbances:		
MILD—where anxiety, apprehension and tension are present	10 mg. t.i.d.	20-60 mg.
MODERATE—where agitation exists in psychoneuroses, alcoholism, intractable pain, senility, etc.	25 mg. t.i.d.	50-200 mg.
SEVERE—in agitated psychotic states as schizophrenia, manic depressive, toxic psychoses, etc.:		
Ambulatory	100 mg. t.i.d.	200-400 mg.
Hospitalized	100 mg. t.i.d.	200-800 mg.
CHILDREN: BEHAVIOR PROBLEMS IN CHILDREN	10 mg. t.i.d.	20-40 mg.

LLARIL Tablets, 10 mg., 25 mg., 100 mg.

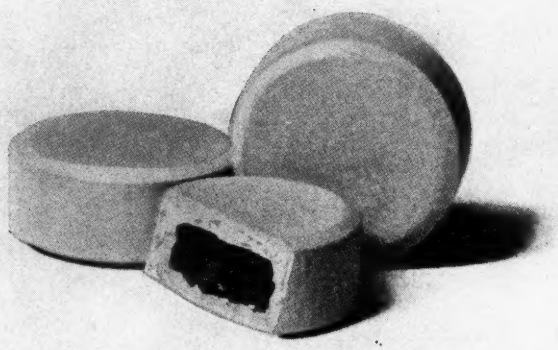
eld, A. M.: Scientific Exhibit, American Academy eneral Practice, San Francisco, April 6-9, 1959

SANDOZ

NEW... to control the pain and the pathogen in acute G. U. infection

AZO KYNEX®

Phenylazodiaminopyridine HCl-Sulfamethoxypyridazine Lederle

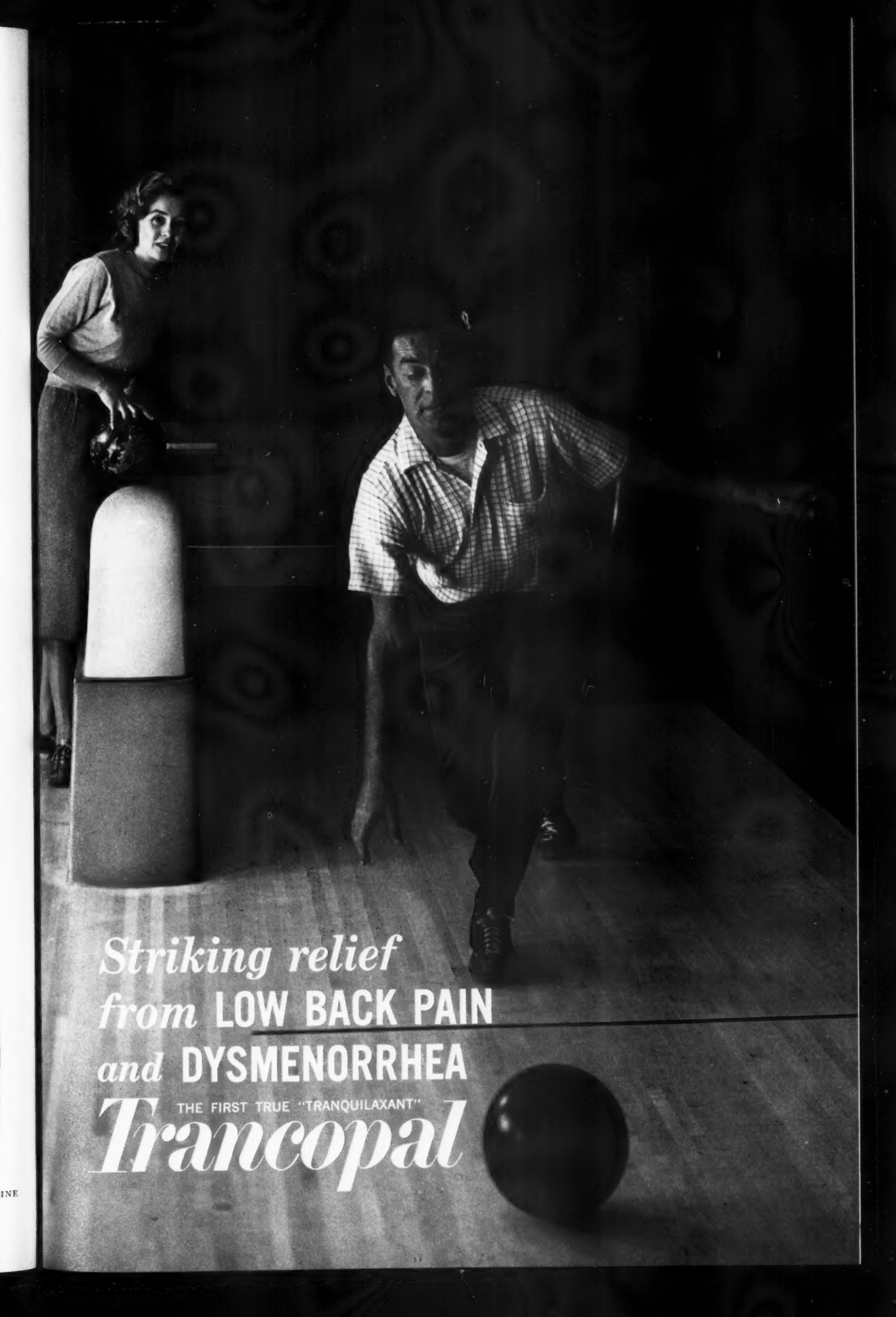


COMPLEMENT FOR KYNEX

Adds fast-acting analgesia of phenylazodiaminopyridine HCl. Relieves burning, urgency and pain-spasm. Eases voiding and retention of infected urine.

... **to unexcelled sulfa control** of KYNEX. Lower dosage of just ½ Gm. daily... prolonged action without hazard of crystalluria... reduced toxic potential... not surpassed by any other sulfa drug, singly or in combination. Dosage: Two tablets q.i.d. first day; one tablet q.i.d. thereafter. Each tablet contains: 125 mg. KYNEX in the shell with 150 mg. phenylazodiaminopyridine HCl in the core.

LEDERLE LABORATORIES, a Division of AMERICAN CYANAMID COMPANY, Pearl River, New York Lederle


Striking relief
from LOW BACK PAIN
and DYSMENORRHEA
THE FIRST TRUE "TRANQUILAXANT"
Trancopal

Here is what you can expect when you prescribe

for dysmenorrhea

and premenstrual tension



Case Profile*

A 28-year-old married woman, a secretary in a booking agency, complained of severe and consistent pain and cramps in the abdomen during her menstrual periods. Psychologically, she described the first two days as "climbing the walls." Menarche occurred at age 13. She has a regular twenty-eight day menstrual cycle and a four day menstrual period.

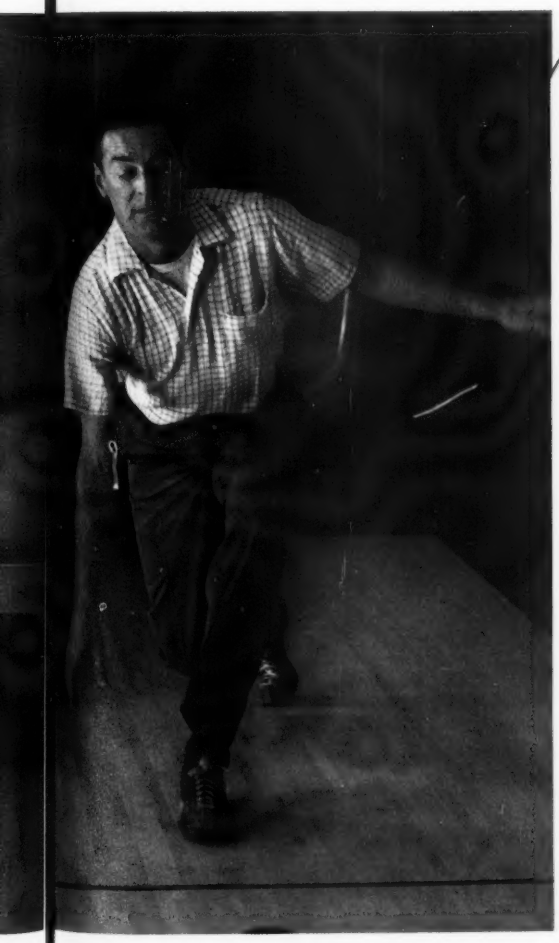
Trancopal was given in a dose of 100 mg. four times a day for the first two days of the four day period. In addition to the relief of the dysmenorrhea she also noticed disappearance of a "bloated feeling" that had previously annoyed her. She has now been treated with Trancopal for one and one-half years with excellent results. Other medication, such as codeine or aspirin with codeine, had relieved the pain, but the patient had had to stay home. Because her father is a physician, many commercial preparations had been tried prior to Trancopal, but no success had been achieved.

Before taking Trancopal this patient missed one day of work every month. For the past year and a half she has not missed a day because of dysmenorrhea.

THE FIRST TRUE "TRANQUILAXANT"

Trancopal®

for low back pain



Case Profile*

A 42-year-old truck driver and mover injured his back while moving a piano. The pain radiated from the sacral region down to the region of the Achilles tendon on the right side. X-rays for ruptured disc revealed nothing pertinent. The day of the injury he was given Trancopal immediately after the physical examination. Although 100 to 200 mg. three times a day were prescribed, the patient on his own responsibility increased the dosage of Trancopal to 400 mg. three times a day. This dosage was continued for three days and then gradually reduced over a ten day period. During this time, the patient continued to drive his truck. The muscle spasm was completely controlled and no apparent side effects were noted.

For the past six months, the patient has continued to take Trancopal 100 to 200 mg. as needed for muscle spasm, particularly during strenuous days.

**Clinical Reports on file at the Department of Medical Research, Winthrop Laboratories.*

Turn page for complete listings of Indications and Dosage.

THE FIRST TRUE "TRANQUILAXANT"

Trancopal

potent MUSCLE RELAXANT

effective TRANQUILIZER

- In musculoskeletal disorders, effective in 91 per cent of patients.[1]
- In anxiety and tension states, effective in 89 per cent of patients.[1]
- Low incidence of side effects (2.3 per cent of patients). Blood pressure, pulse rate, respiration and digestive processes are unaffected by therapeutic dosage. It does not affect the hematopoietic system or liver and kidney function.
- No gastric irritation. Can be taken before meals.
- No clouding of consciousness, no euphoria or depression.

Indications [1-6]

Musculoskeletal:

Low back pain (lumbago, etc.)
Neck pain (torticollis)
Bursitis
Rheumatoid arthritis
Osteoarthritis
Disc syndrome
Fibrositis
Ankle sprain, tennis elbow
Myositis
Postoperative muscle spasm

Psychogenic:

Anxiety and tension states
Dysmenorrhea
Premenstrual tension
Asthma
Angina pectoris
Alcoholism

Now available in two strengths:



Trancopal Caplets®,
100 mg. (peach colored, scored), bottles of 100.

NEW STRENGTH ▶



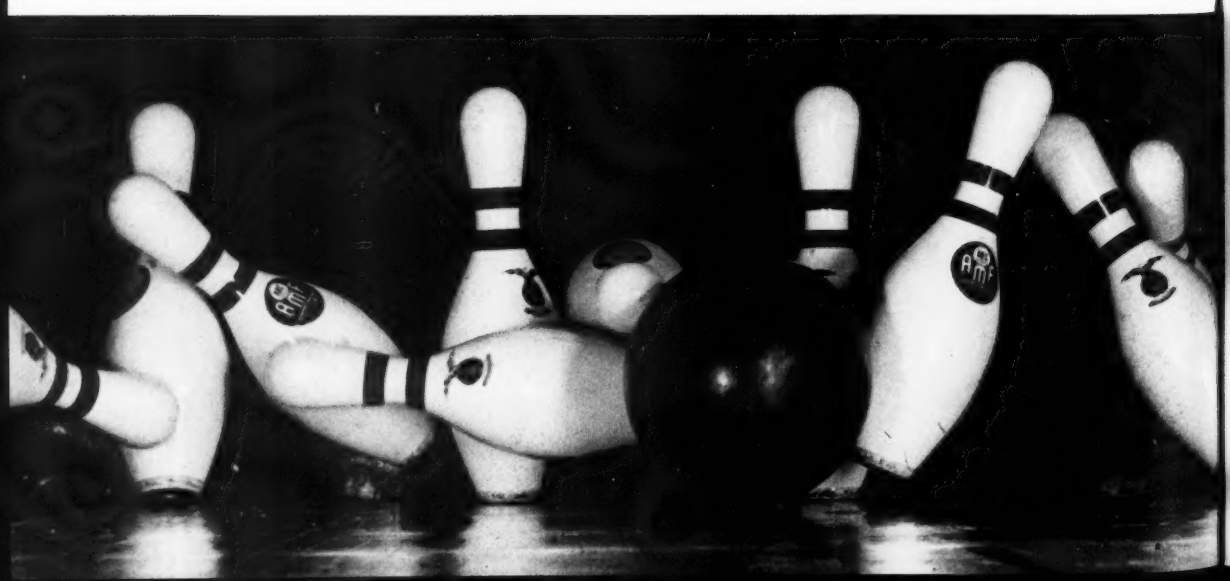
Trancopal Caplets,
200 mg. (green colored, scored), bottles of 100.

Dosage: Adults, 100 or 200 mg. orally three or four times daily. Relief of symptoms occurs in from fifteen to thirty minutes and lasts from four to six hours.

Winthrop LABORATORIES
New York 18, N. Y.

References: 1. Collective Study, Department of Medical Research, Winthrop Laboratories. 2. Lichtman, A. L.: New developments in muscle relaxant therapy, *Kentucky Acad. Gen. Pract. J.* 4:28, Oct., 1958. 3. Lichtman, A. L.: Relief of muscle spasm with a new central muscle relaxant, chlormezanone (Trancopal), Scientific Exhibit, Meeting of the International College of Surgeons, Miami Beach, Fla., Jan. 4-7, 1959. 4. Ganz, S. E.: Clinical evaluation of a new muscle relaxant (chlormethazanone), *J. Indiana M. A.* 52:1134, July, 1959. 5. Mullin, W. G., and Epifano, Leonard: Chlormezanone, a tranquilizing agent with potent skeletal muscle relaxant properties, *Am. Pract. Digest Treat.* 10:1743, Oct., 1959. 6. Shanaphy, J. F.: Chlormezanone (Trancopal) in the treatment of dysmenorrhea; a preliminary report, *Current Therap. Res.* 1:59, Oct., 1959.

Trancopal (brand of chlormezanone) and Caplets, trademarks reg. U.S. Pat. Off. 1408M Printed in U.S.A.



whenever there is inflammation, swelling, pain

VARIDASE

STREPTOKINASE-STREPTODORNASE LEDERLE

BUCCAL

Tablets

conditions for a fast comeback



as in episiotomy

VARIDASE Buccal provides a simple, natural way to faster, early healing. By activating the fibrinolytic enzymes responsible for normal recovery, VARIDASE shortens the catabolic phase of host response and reverses inflammatory reaction. Edema is reduced.

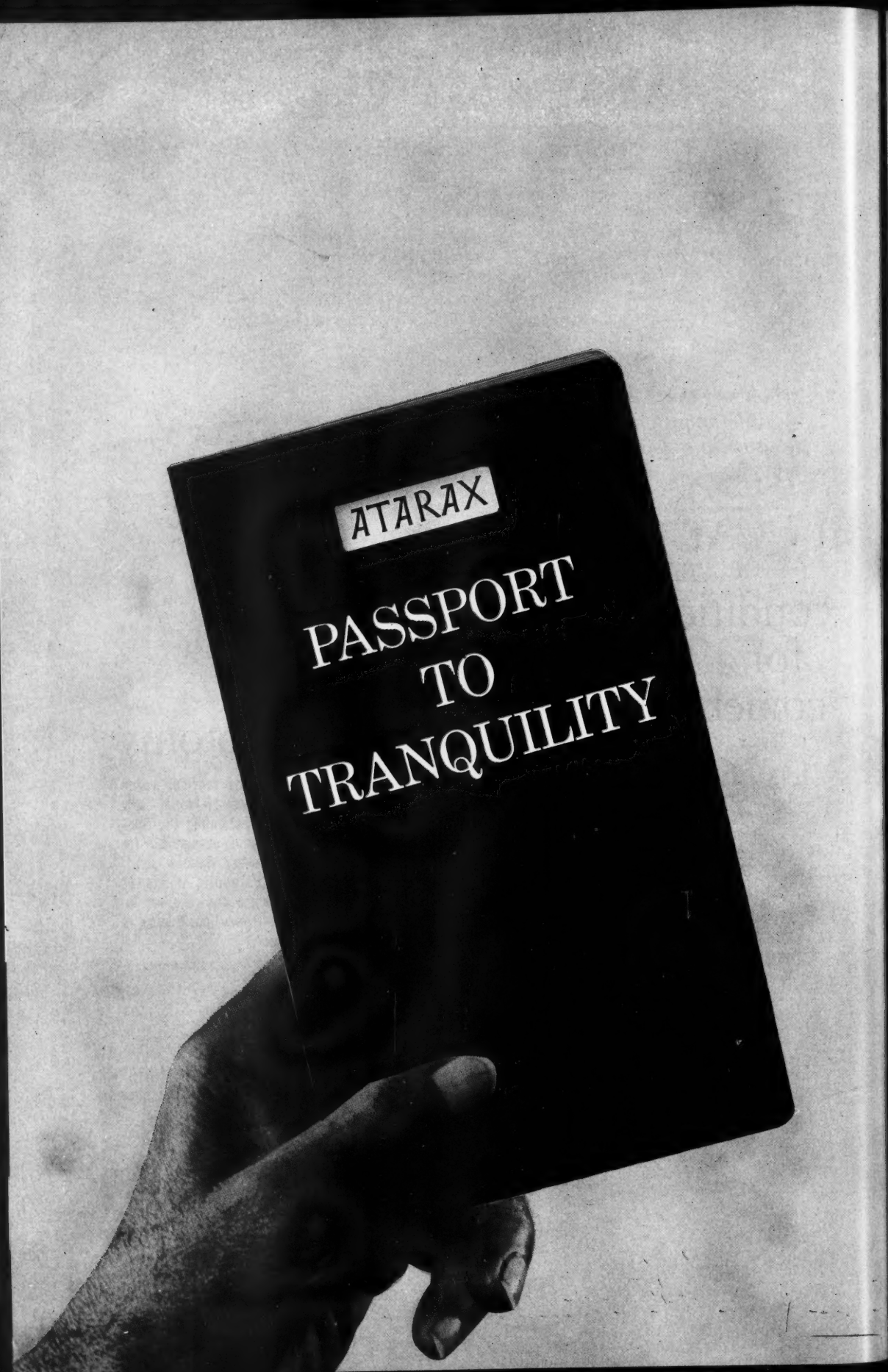
VARIDASE is not an anti-infective, but by increasing the permeability of the fibrin wall, it eases penetration of natural regenerative factors and fosters healthy tissue growth, making infection less likely.

VARIDASE Buccal Tablets contain: 10,000 Units Streptokinase and 2,500 Units Streptodornase.

Supplied: Boxes of 24 and 100.

Lederle

LEDERLE LABORATORIES,
a Division of American Cyanamid Co.,
Pearl River, New York


ATARAX
PASSPORT
TO
TRANQUILITY

Passport

☞ **a universal record of effectiveness**

In anxiety, tension and agitation, ATARAX "... produced a more favorable state of calm and tranquility than any drug previously used."[1]

☞ **widest latitude of safety and flexibility**

No serious adverse reaction ever documented – five dosage forms and sizes

☞ **chemically distinct among tranquilizers**

Not a phenothiazine or a meprobamate

☞ **added frontiers of usefulness**

These unique benefits in specific indications

ANTIHISTAMINIC
ANTIARRHYTHMIC
ANTISECRETORY

BACKED BY A WORLD OF EXPERIENCE

Dosage: ADULTS, one 25 mg. tablet, or one tbsp. Syrup q.i.d. CHILDREN – 3-6 years, one 10 mg. tablet or one tsp. Syrup t.i.d.; over 6 years, two 10 mg. tablets or two tsp. Syrup t.i.d.

Supplied: Tiny 10 mg., 25 mg., and 100 mg. tablets, bottles of 100. Syrup, pint bottles. Parenteral Solution, 10 cc. multiple-dose vials.

References: 1. Farah, L.: Internat. Rec. Med. *169*:379 (June) 1956. 2. Smigel, J. O., et al.: J. Am. Geriatrics Soc. *7*:61 (Jan.) 1959. 3. Feinberg, A. R., et al.: J. Allergy *29*:358 (July) 1958. 4. Eisenberg, B. C.: J.A.M.A. *169*:14 (Jan. 3) 1959. 5. Maryssael, L.: Bruxelles-méd. *38*:141 (Jan. 26) 1958. 6. Pfleger, R.: Med. Klin. *53*:1030 (June 5) 1958. 7. Over 200 laboratory and clinical papers from 14 countries.

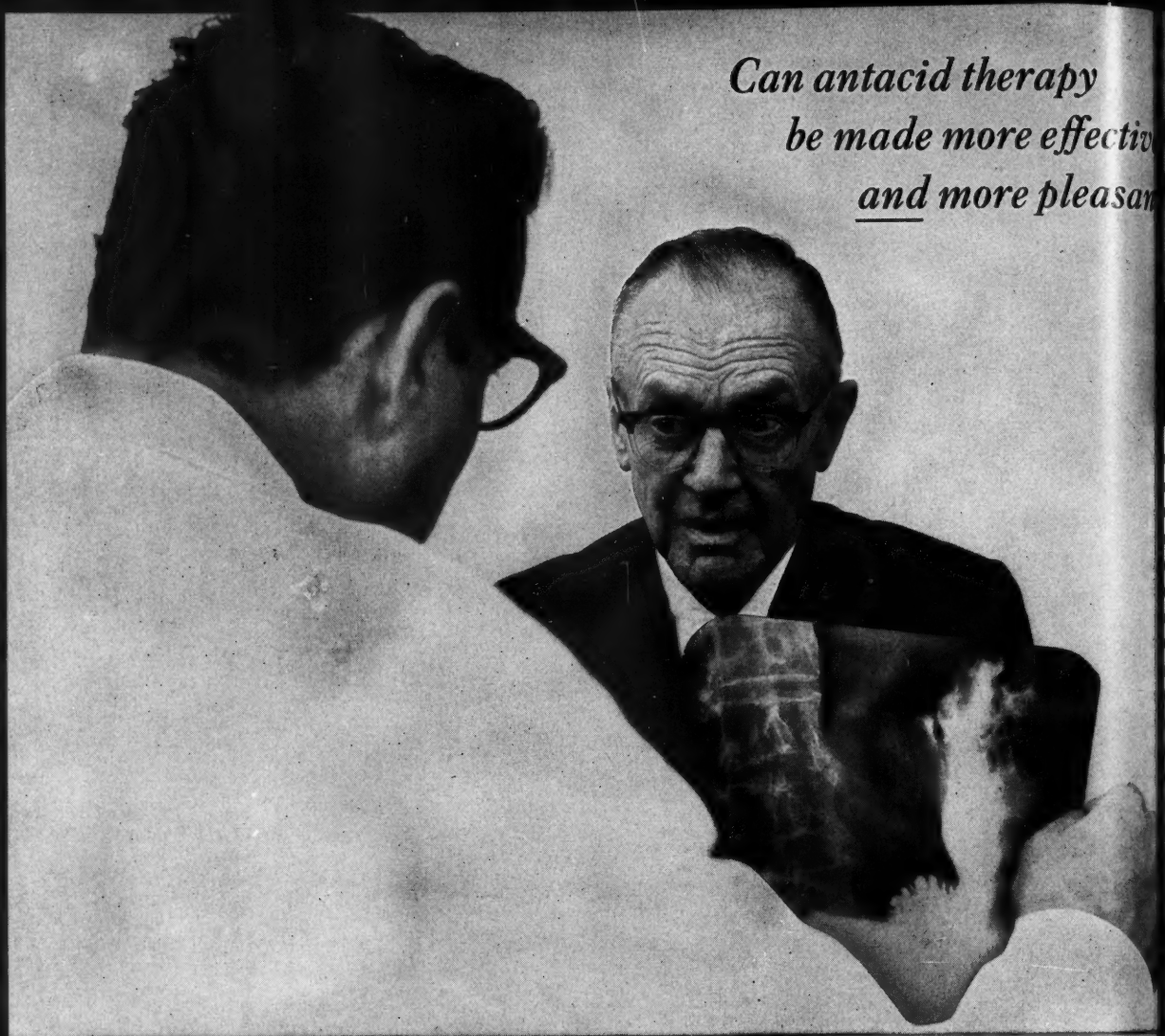
ATARAX®

PASSPORT TO TRANQUILITY

(brand of hydroxyzine)

ROERIG Rx

New York 17, N. Y.
Division, Chas. Pfizer & Co., Inc.
Science for the World's Well-Being



THE MOST SIGNIFICANT IMPROVEMENT IN ANTACID THERAPY SINCE THE INTRODUCTIO OF ALUMINUM HYDROXIDE IN 1929

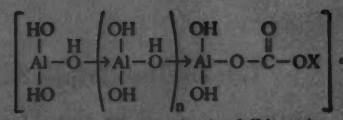
NEW Creamalin®

ANTA TABLE

Each Creamalin Antacid Tablet contains 320 mg. specially processed, highly reactive, short p mer dried aluminum hydroxide gel, (stabilized with hexitol), with 75 mg. magnesium hydro

1. *Neutralizes acid faster (quicker relief)*
2. *Neutralizes more acid (greater relief)*
3. *Neutralizes acid longer (more lasting relief)*
4. *No constipation • No acid rebound*
5. *More pleasant to take*

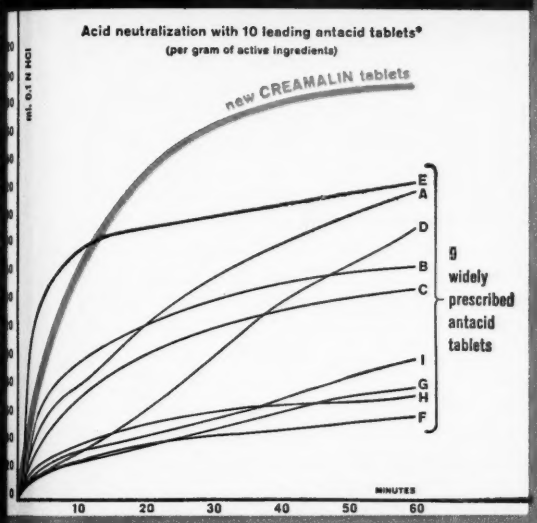
new high in effectiveness
nd palatability



n is at least 1 and averages less than 6. X is a cation.

CREAMALIN NEUTRALIZES *MORE* ACID *FASTER*

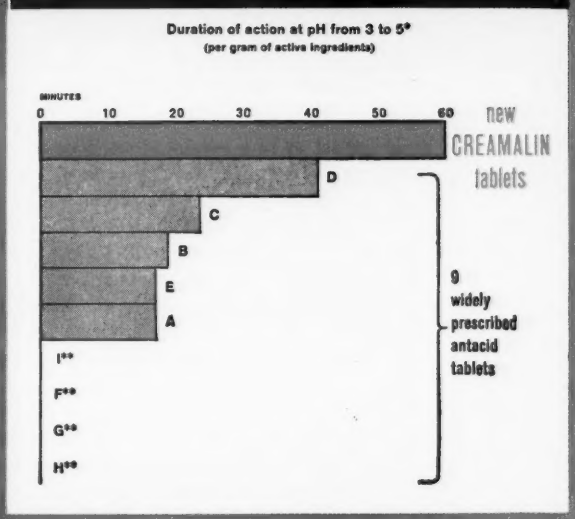
Quicker Relief • Greater Relief



*...ets were powdered and suspended in distilled water in a constant temperature ...ainer (37°C) equipped with mechanical stirrer and pH electrodes. Hydrochloric ...d was added as needed to maintain pH at 3.5. Volume of acid required was ...orded at frequent intervals for one hour.

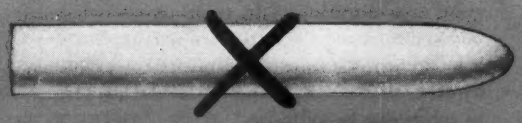
CREAMALIN NEUTRALIZES *MORE* ACID *LONGER*

More Lasting Relief



*Hinkel, E. T., Jr., Fisher, M. P. and Tainter, M. L.: A new highly reactive aluminum hydroxide complex for gastric hyperacidity. To be published.
**pH stayed below 3.





No chalky taste. New CREAMALIN tablets are not chalky, gritty, rough or dry. They are highly palatable, soft, smooth, easy to chew, mint flavored.

• NO ACID REBOUND • NO CONSTIPATION
• NO SYSTEMIC EFFECT

Adult Dosage: Gastric hyperacidity: 2 to 4 tablets as necessary. Peptic ulcer or gastritis: 2 to 4 tablets every two to four hours. Tablets may be chewed, swallowed with water or milk, or allowed to dissolve in the mouth.

Supplied: Bottles of 50, 100, 200 and 1000.

Winthrop LABORATORIES • NEW YORK 18, NEW YORK

Tetracycline-Triple Sulfa Combination (TETREX® c̄ T/S) in the Treatment of INFECTION

It is generally agreed that it is ideal to withhold antibiotic and chemotherapeutic drugs until after sensitivity tests show which antibacterial agent will be most effective. But very often, in actual practice, the physician knows that delay in starting antibacterial treatment may be detrimental to the welfare of his patient. He must then select the therapy to meet the most serious and immediate threats to the patient.

Why Combination Therapy?

Certain infections do not respond as well to a single agent as to a combination. *Hemophilus influenzae* infections, which are frequent in children, are a particularly serious threat to infants and children up to about 3 or 4 years of age since they have not yet built up any appreciable immunity. Serious complications such as influenzal pneumonia, empyema, or meningitis may develop, especially in this age group. In fact, except for those periods when meningococcal meningitis is epidemic, *H. influenzae* is the most frequent cause of meningitis.[1] This gram-negative organism is highly susceptible both to the tetracyclines and to the sulfonamides. Even in severe infections, therapeutic failure can be virtually eliminated by giving sulfonamides plus tetracycline.[1] These two agents together constitute the treatment of choice, and give better results than either alone.[2]

Sulfonamides remain the drugs of choice for all meningococcal infections, including meningitis. They readily penetrate the blood-brain barrier and pass into the cerebrospinal fluid in good concentrations.[3] In treating overwhelming meningococcal infections, and complicating infections of the upper respiratory tract caused by other organisms, the addition of tetracycline to sulfas can be valuable.[4]

In recent years the sulfonamides have again been prescribed more and more frequently. In certain serious infections, better results can be obtained with a combination of antibiotic and sulfonamide than with either drug alone (e.g., severe pneumococcal pneumonia or pneumococcal meningitis[5]). Furthermore, mixed infections, to which young children are particularly susceptible, often respond only to combination therapy such as tetracycline with sulfonamides (TETREX c̄ T/S).

Why Triple Sulfas?

Some sulfonamides, though therapeutically useful, frequently crystallize and cause renal damage. Sulfonamide mixtures are designed to prevent this effect. It is known that different substances can coexist in solution without interfering with each other's solubility. In such a solution each component behaves as if it alone were present. Thus, a much larger total amount of sulfonamide can exist in the urine without precipitating if a mixture is administered than if the same amount of only one compound is given.

Similarly, there is less danger of hypersensitivity with mixtures. The incidence of sensitization varies directly with the dosage and is limited to the particular sulfa given. Simultaneous use of several sulfa compounds, each in partial dosage, tends to keep each drug below its own sensitization level.[3] As with all sulfonamides, it is advisable to check for possible blood dyscrasias, rash, or renal toxicity during extended administration.

TETREX c̄ T/S, by combining only 167 mg. each of sulfadiazine, sulfamerazine, and sulfamethazine, practically eliminates serious renal damage and sensitization reactions due to sulfonamides while retaining the therapeutic efficacy of the total dose.

TETREX c̄ T/S can be administered with confidence in all severe and mixed infections due to tetracycline-sensitive and sulfonamide-sensitive organisms, including infections of the upper respiratory, urinary, and gastrointestinal tracts.

References: 1. Alexander, H. E.: The hemophilus group. In: Dubois, R. J.: Bacterial and Mycotic Infections of Man. Ed. 3, Philadelphia, J. B. Lippincott Co., 1958, p. 470ff. 2. Goodman, L. S., and Gilman, A.: The Pharmacological Basis of Therapeutics. Ed. 2, New York, The Macmillan Co., 1956, pp. 1322-1323. 3. Beckman, H.: Drugs — Their Nature, Action, and Use. Philadelphia, W. B. Saunders Co., 1958, pp. 527-528. 4. Dingle, J. H.: Meningococcal infections. In: Cecil, R. L., and Loeb, R. F.: A Textbook of Medicine. Ed. 9, Philadelphia, W. B. Saunders Co., 1955, p. 196ff. 5. Goodman, L. S., and Gilman, A.: The Pharmacological Basis of Therapeutics. Ed. 2, New York, The Macmillan Co., 1956, p. 1308.

TETREX® c̄ T/S

Antibiotic-triple sulfa combination in a palatable, cherry-flavored syrup.

Each 5 ml. teaspoonful contains:

Tetracycline (ammonium polyphosphate buffered equivalent to tetracycline HCl activity)	125 mg.
Sulfadiazine	167 mg.
Sulfamerazine	167 mg.
Sulfamethazine	167 mg.

This suspension may be stored at normal room temperature.

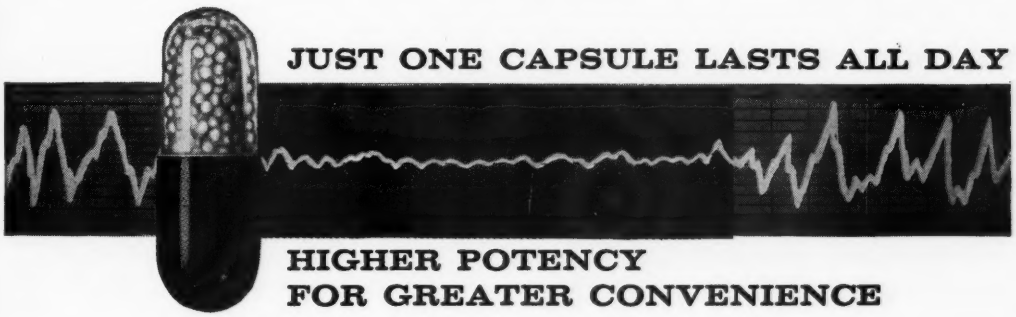
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FOR SUSTAINED TRANQUILIZATION

MILTOWN® (*meprobamate*) now available
in 400 mg. continuous release capsules as

Meprospan®-400



JUST ONE CAPSULE LASTS ALL DAY

**HIGHER POTENCY
FOR GREATER CONVENIENCE**

- relieves *both* mental and muscular tension without causing depression
- does not impair mental efficiency, motor control, or normal behavior

Usual dosage: One capsule at breakfast, one capsule with evening meal

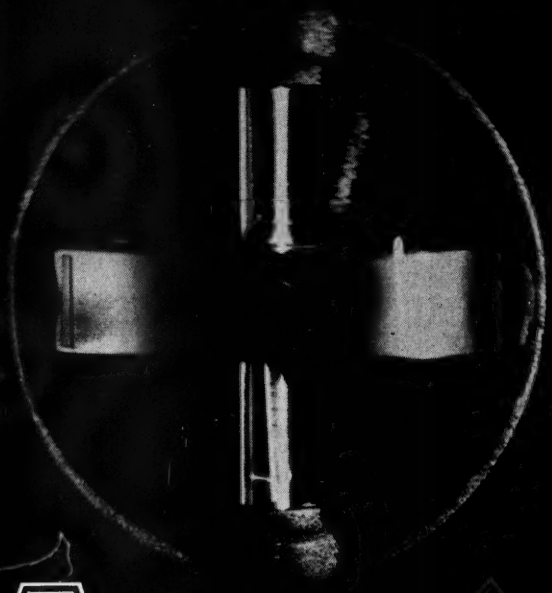
Available: *Meprospan-400*, each blue capsule contains 400 mg. Miltown (meprobamate)
Meprospan-200, each yellow capsule contains 200 mg. Miltown (meprobamate)

Both potencies in bottles of 30.

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minimal disturbance
of the patient's chemical and psychic balance . . .



still unsurpassed for total corticosteroid benefits

Arist

Substantiated by published reports of leading clinicians:

- **effective control** of allergic and inflammatory symptoms[1-20]
- **minimal disturbance** of the patient's chemical and psychic balance[1, 4, 5, 8-19]

stocort®

Triamcinolone LEDERLE

nti-inflammatory and antiallergic levels ARISTOCORT means:

- **freedom from salt and water retention**
- **virtual freedom from potassium depletion**
- **negligible calcium depletion**
- **euphoria and depression rare**
- **no voracious appetite—no excessive weight gain**
- **low incidence of peptic ulcer**
- **low incidence of osteoporosis with compression fracture**

ions: rheumatoid arthritis; arthritis; respiratory allergies; allergic and inflammatory oses; disseminated lupus erythematosus; nephrotic syndrome; lymphomas and leukemias.

ions: With ARISTOCORT all traditional precautions to corticosteroid therapy should be ob- Dosage should always be carefully adjusted to the smallest amount which will suppress ms. After patients have been on steroids for prolonged periods, discontinuance must be out gradually.

d: Scored tablets of 1 mg. (yellow); 2 mg. (pink); 4 mg. (white); 10 mg. (white).
te Parenteral (for intra-articular and intrasynovial injection). Vials of 5 cc. (25 mg./cc.).

References: 1. Feinberg, S.M., Feinberg, A.R., and Fisherman, E.W.: *J.A.M.A.* 167:58 (May 3) 1958. 2. Epstein, J.I. and Sherwood, H.: *Connecticut Med.* 22:822 (Dec.) 1958. 3. Friedlaender, S. and Friedlaender, A.S.: *Antibiotic Med. & Clin. Ther.* 5:315 (May) 1958. 4. Segal, M.S. and Duvenci, J.: *Bull. Tufts North East M. Center* 4:71 (April-June) 1958. 5. Segal, M.S.: Report to the A.M.A. Council on Drugs, *J.A.M.A.* 169:1063 (March 7) 1958. 6. Sherwood, H. and Cooke, R.A.: *J. Allergy* 28:97 (Mar.) 1958. 7. Duke, C.J. and Oviedo, R.: *Antibiotic Med. & Clin. Ther.* 5:710 (Dec.) 1958. 8. McGavack, T.H.: *Clin. Med.* (June) 1958. 9. Freyberg, R.H.; Berntsen, C.A., and Hellman, L.: *Arthritis and Rheumatism* 1:215 (June) 1958. 10. Hartung, E.F.: *J.A.M.A.* 167:973 (June 21) 1958. 11. Hartung, E.F.: *J. Florida Acod. Gen. Pract.* 8:18, 1958. 12. Zuckner, J.; Ramsey, R.H.; Caciolo, C., and Gantner, G.E.: *Ann. Rheum. Dis.* 17:398 (Dec.) 1958. 13. Appel, B.; Tye, M.J., and Leibsohn, E.: *Antibiotic Med. & Clin. Ther.* 5:716 (Dec.) 1958. 14. Kalz, F.: *Canad. M.A.J.* 79:400 (Sept.) 1958. 15. Mullins, J.F., and Wilson, C.J.: *Texas State J. Med.* 54:648 (Sept.) 1958. 16. Shelley, W.B.; Harun, J.S., and Pillsbury, D.M.: *J.A.M.A.* 167:959 (June 21) 1958. 17. DuBois, E.F.: *J.A.M.A.* 167:1590 (July 26) 1958. 18. McGavack, T.H.; Kao, K.T.; Leake, D.A.; Bauer, H.G., and Berger, H.E.: *Am. J. Med. Sc.* 236:720 (Dec.) 1958. 19. Council on Drugs: *J.A.M.A.* 169:257 (Jan. 17) 1959. 20. Rein, C.R.; Fleischmajer, R., and Rosenthal, A.R.: *J.A.M.A.* 165:1821 (Dec. 7) 1957.

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Blood pressure
before Apresoline-Esidrix:

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Added benefits: Lowered dosage requirements, fewer side effects • Improved renal blood flow • Relaxed cerebral vascular tone • Excellent diuresis in decompensated cases

SUPPLIED: Apresoline-Esidrix Tablets (orange), each containing 25 mg. of Apresoline hydrochloride and 15 mg. of Esidrix; bottles of 100.

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Combination Tablets

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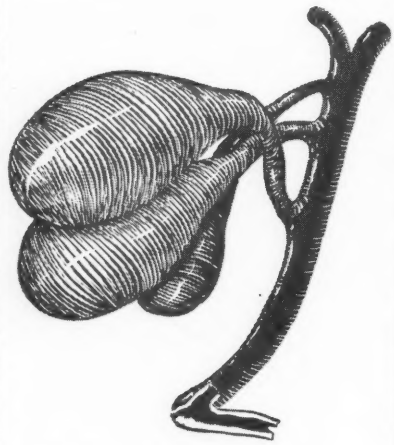
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One hundred and twenty-two cases of *vesica fellea divisa* (bilobed gallbladder) and *vesica fellea duplex* (double gallbladder with 2 cystic ducts) are reported in the literature. A unique case of *vesica fellea triplex* has recently been described.

Source: Skilboe, B.: Am. J. Clin. Path. *30*:252, 1958.



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"...dehydrocholic acid...does considerably increase the volume output of a bile of relatively high water content and low viscosity. This drug is therefore a good 'flusher,' and is effectively used in treating both the chronic unoperated patient and the patient who has a T-tube drainage of an infected common bile duct."[1]

free-flowing bile
plus reliable spasmolysis

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"...DECHOLIN/Belladonna in a dosage of one tablet t.i.d. for a period of two to three months may prove helpful in relieving postoperative symptoms, aiding the digestion, and facilitating elimination."[2]

(1) Beckman, H.: Drugs: Their Nature, Action and Use, Philadelphia, W. B. Saunders Company, 1958, p. 425.
(2) Biliary Tract Diseases, M. Times *85*:1081, 1957.

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NIAMID*

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NIAMID gives the depressed elderly person a new sense of well-being. The family will notice a sunnier outlook, an alert interest in group activities, a renewed awareness of personal appearance, and a return of appetite. Your patient will be more cooperative and less demanding.

You can expect to see the same excellent response to NIAMID in a wide variety of depressive syndromes—acute or chronic, mild or severe, whether associated with long-standing or incurable illness, or masquerading as organic disease.

NIAMID side effects are infrequent and mild, and often lessened or eliminated by a reduction in dosage. NIAMID has not been reported to cause jaundice, and significant hypotensive effects have rarely been noted.

DOSAGE: Start with 75 mg. daily in single or divided doses, and adjust according to patient response. NIAMID acts slowly, without rapid jarring of physical or mental processes. Some patients respond to NIAMID within a few days, but for full therapeutic benefit, most require at least two weeks. NIAMID is available as 25 mg. (pink) and 100 mg. (orange) scored tablets.

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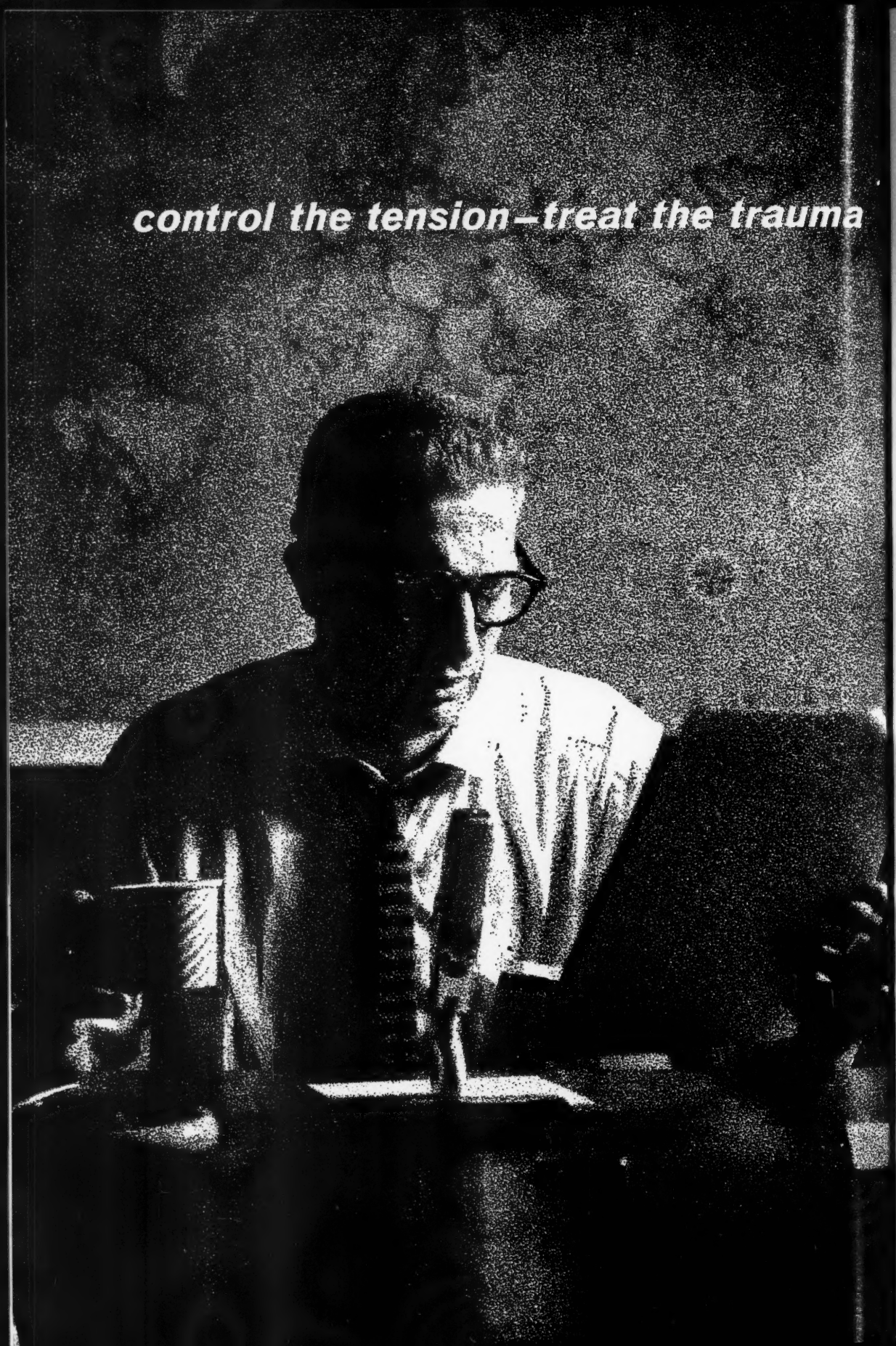
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control the tension–treat the trauma

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greater flexibility in the control of tension, hypermotility and excessive secretion in gastrointestinal dysfunctions

PATHIBAMATE combines two highly effective and well-tolerated therapeutic agents:

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Because of individual variation in the intensity of stimuli in gastrointestinal disorders, adequate dosage for optimum control may be expected to vary as well. The dosage strengths of PATHIBAMATE-400 and PATHIBAMATE-200 facilitate individualization of treatment in respect to both the degree of tension and associated G.I. sequelae, as well as the response of different patients to the component drugs.

Supplied: PATHIBAMATE-400—Each tablet (yellow, 1/2-scored) contains meprobamate, 400 mg.; PATHILON tridihexethyl chloride, 25 mg.
PATHIBAMATE-200—Each tablet (yellow, coated) contains meprobamate, 200 mg.; PATHILON tridihexethyl chloride, 25 mg.

Administration and Dosage: PATHIBAMATE-400—1 tablet three times a day at mealtime and 2 tablets at bedtime.
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Adjust to patient response.

Contraindications: glaucoma; pyloric obstruction, and obstruction of the urinary bladder neck.

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Veratrite now contains cryptenamine which acts centrally to produce a gradual fall in blood pressure, yet improves circulation to vital organs, relieves dizziness and headache, and imparts a distinct sense of well-being. Furthermore, Veratrite achieves its effects with unusual safety and without annoying side effects.

Each Veratrite tabule contains: Cryptenamine (tannates), 40 C.S.R.* Units; Sodium nitrite, 1 gr.; Phenobarbital, ¼ gr. Dosage: 1–2 tabules t.i.d., preferably 2 hours after meals.

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a logical combination in appetite control

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meprobamate with dextro-amphetamine sulfate LEDERLE

meprobamate eases tensions of dieting

d-amphetamine depresses appetite and elevates mood

...without overstimulation

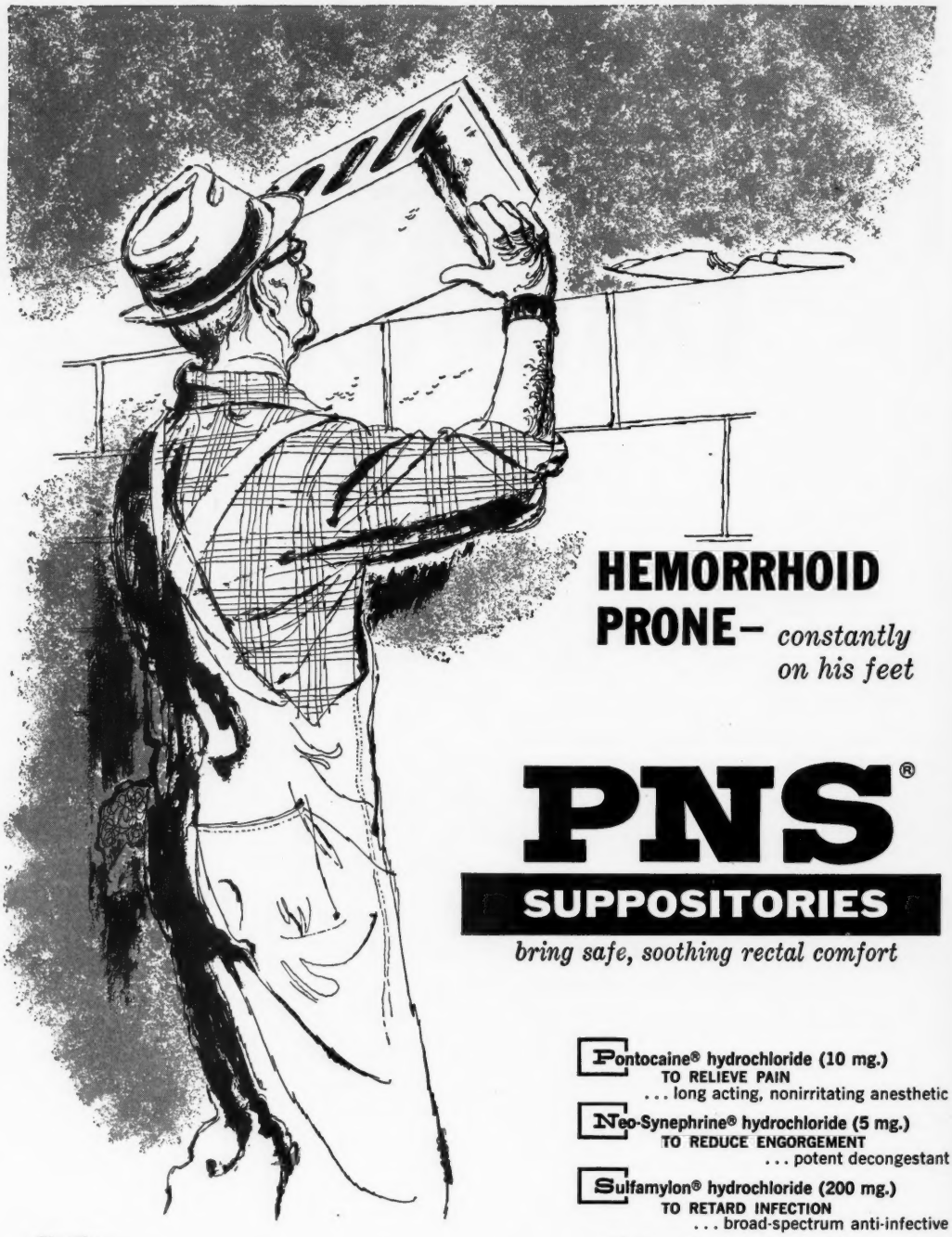
...without insomnia

...without barbiturate hangover

Each coated tablet (pink) contains:
d-amphetamine sulfate .... 5 mg.
meprobamate ..... 400 mg.
Dosage: One tablet taken one-half to one hour before each meal.

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SUPPOSITORIES

bring safe, soothing rectal comfort

Pontocaine® hydrochloride (10 mg.)
TO RELIEVE PAIN
... long acting, nonirritating anesthetic

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TO REDUCE ENGORGEMENT
... potent decongestant

Sulfamylon® hydrochloride (200 mg.)
TO RETARD INFECTION
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Directions:
1 suppository rectally after each bowel movement and on retiring.

How Supplied:
Boxes of 12.

As an added measure to promote rectal comfort while correcting bowel atonicity, add MUCILOSE®-SUPER to the patient's diet. This lubricating, nonirritating bulk laxative and stool softener will encourage easy, regular evacuation.

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for rapid control of infection throughout the G. U. system

Rapid bactericidal action against a wide range of gram-positive and gram-negative bacteria including organisms such as staphylococci, Proteus and certain strains of Pseudomonas, resistant to other agents ■ actively excreted by the tubule cells in addition to glomerular filtration ■ negligible development of bacterial resistance after 7 years of extensive clinical use ■ excellent tolerance—nontoxic to kidneys, liver and blood-forming organs ■ safe for long-term administration

AVERAGE FURADANTIN ADULT DOSAGE: 100 mg. q.i.d. with meals and with food or milk on retiring. Supplied: Tablets, 50 and 100 mg.; Oral Suspension, 25 mg. per 5 cc. tsp.

REFERENCES: 1. Editorial: J.M.A. Georgia 46:433, 1957. 2. Colby, F. H.: Essential Urology, Baltimore, The Williams & Wilkins Co., 1953, p. 330.

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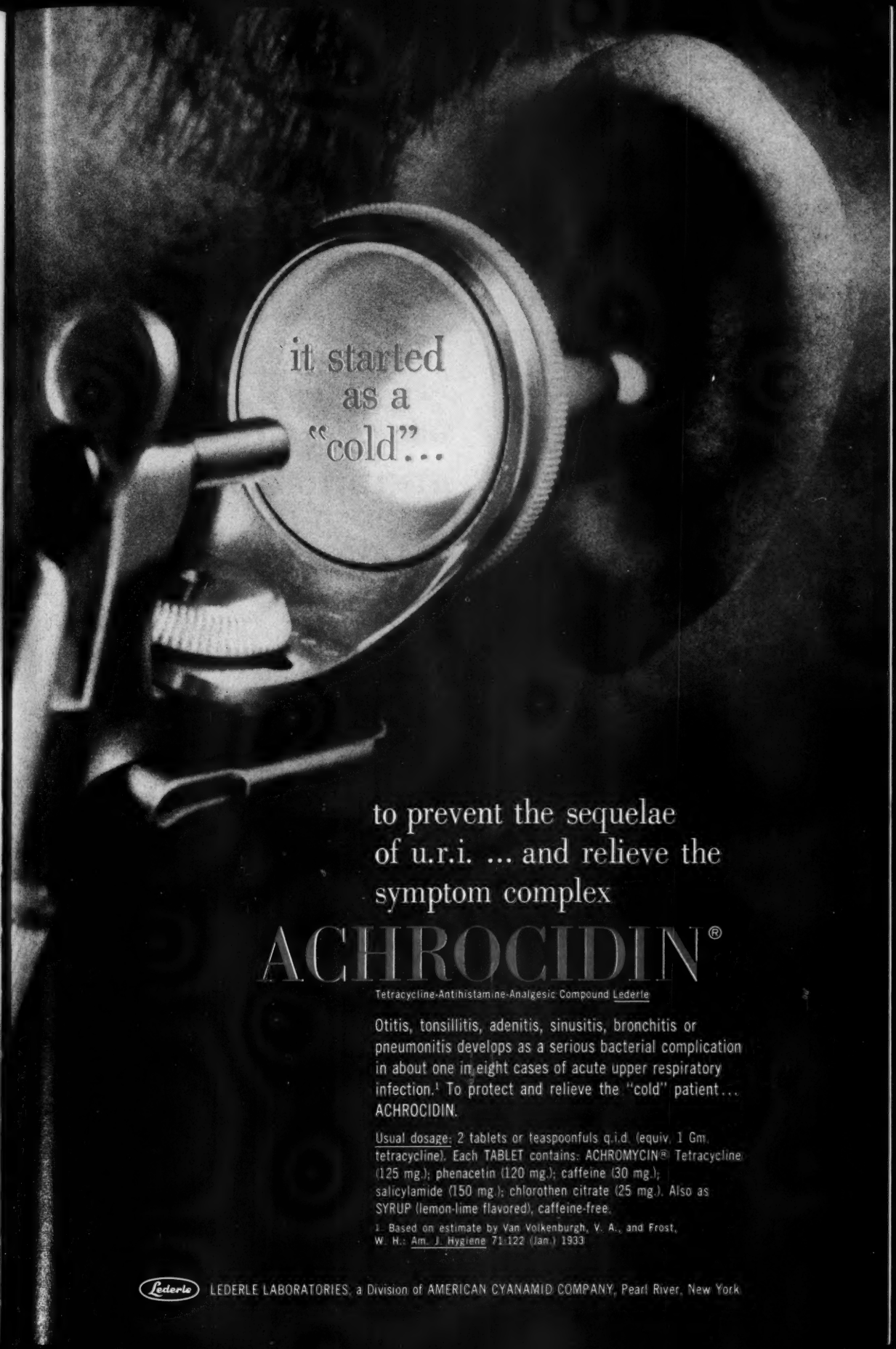
VISTARIL has an outstanding record of safety and is valuable adjunctive therapy in home or hospital when administered to patients with peptic ulcer, gastroenteritis, esophageal spasm, and nervous dyspepsia.

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Supply: Capsules—25, 50 and 100 mg.; Parenteral Solution—10 cc. vials and 2 cc. Steraject® Cartridges, each cc. containing 25 mg. hydroxyzine HCl.

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to prevent the sequelae of u.r.i. ... and relieve the symptom complex

ACHROCIDIN®

Tetracycline-Antihistamine-Analgesic Compound Lederle

Otitis, tonsillitis, adenitis, sinusitis, bronchitis or pneumonitis develops as a serious bacterial complication in about one in eight cases of acute upper respiratory infection.[1] To protect and relieve the "cold" patient... ACHROCIDIN.

Usual dosage: 2 tablets or teaspoonfuls q.i.d. (equiv. 1 Gm. tetracycline). Each TABLET contains: ACHROMYCIN® Tetracycline (125 mg.); phenacetin (120 mg.); caffeine (30 mg.); salicylamide (150 mg.); chlorothen citrate (25 mg.). Also as SYRUP (lemon-lime flavored), caffeine-free.

1. Based on estimate by Van Volkenburgh, V. A., and Frost, W. H.: Am. J. Hygiene 71:122 (Jan.) 1933

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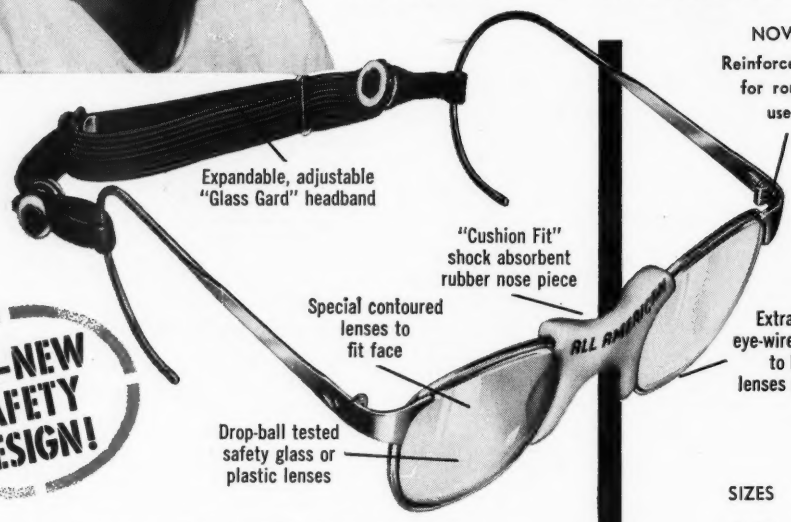
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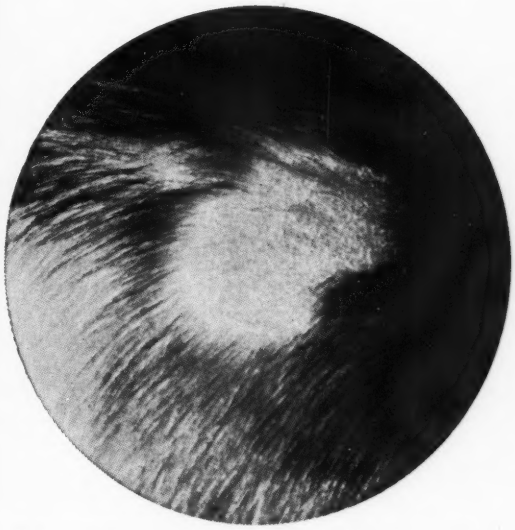
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clears the tineas from head to toe– orally

new **fulvicin**™
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In tinea capitis



Before FULVICIN: Tinea capitis *(Microsporum audouini)* in a 7-year-old boy.



After FULVICIN: Normal, new hair growth after 6 weeks of oral therapy.

Photos courtesy of M. M. Nierman, M.D., Calumet City, Ill.

Lesions clear, cultures become negative in

tinea corporis: 4 to 5 weeks[1]
tinea cruris: 4 to 6 weeks[1]
onychomycosis: 4 to 6 months[1]
tinea pedis: 6 to 8 weeks[1]

first *oral* fungistat to penetrate keratin *from the inside*... acts to check invading ringworm fungi *(Microsporum, Trichophyton, Epidermophyton)*...usually well tolerated, side effects rare in therapeutic doses.

For complete information about dosage, indications and precautions consult Schering Statement of Directions.

Packaging: FULVICIN Tablets, 250 mg., bottles of 30 and 100.

1. Robinson, H. M., Jr., *et al.*: Griseofulvin, Clinical and Experimental Studies, A.M.A. Arch. Dermat., in press.

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ILOSONE® 125
Lauryl Sulfate
SUSPENSION

Formula:
Each 5-cc. teaspoonful provides Ilosone Lauryl Sulfate equivalent to 125 mg. erythromycin base activity.

Usual Dosage:

10 to 25 pounds	5 mg. per pound of body weight	every six hours
25 to 50 pounds	1 teaspoonful	
Over 50 pounds	2 teaspoonfuls	

In more severe infections, these dosages may be doubled.

Supplied:
In bottles of 60 cc.

Ilosone® (propionyl erythromycin ester, Lilly)
Ilosone® Lauryl Sulfate (propionyl erythromycin ester lauryl sulfate, Lilly)

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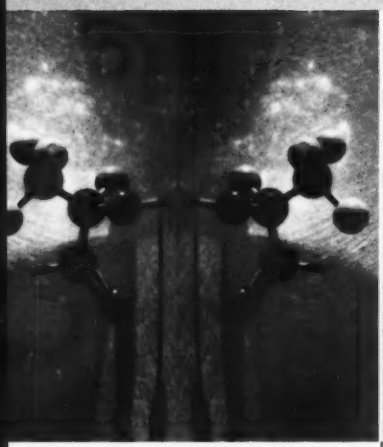
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BRISTOL LABORATORIES

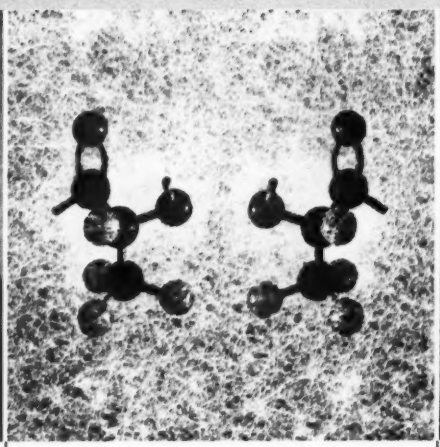


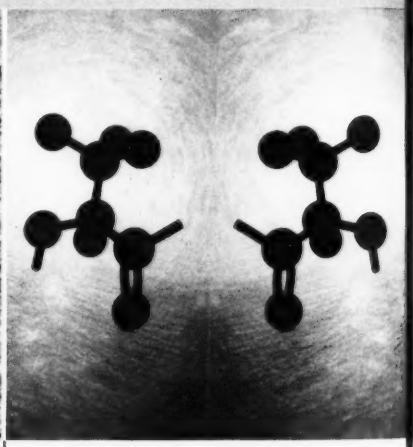
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SYNC







BLOOD LEVELS TWICE AS HIGH AS WITH POTASSIUM PENICILLIN V

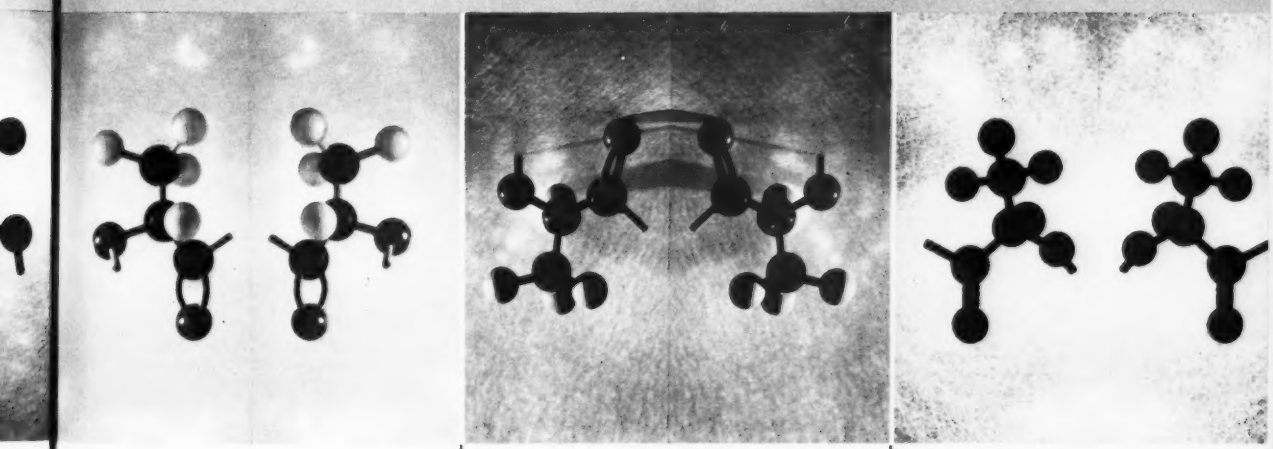
SAFER ORAL ROUTE PROVIDES HIGHER BLOOD LEVELS THAN INTRAMUSCULAR PENICILLIN G

IMPROVED ANTIBIOTIC EFFECT FROM COMPLEMENTARY ACTION OF ISOMERS

ADVANTAGES ACCOMPANY MOLECULAR ASYMMETRY

ILLIN™

POTASSIUM PENICILLIN-152



ANTIBIOTIC ACTIVITY DIRECTLY PROPORTIONAL TO ORAL DOSE

REDUCED HAZARD OF SERIOUS ALLERGENICITY BY SAFER ORAL ROUTE

MANY STAPH STRAINS MORE SENSITIVE TO SYNCILLIN

BRISTOL

ORIGIN OF A NEW SYNTHETIC PENICILLIN

In March, 1957, Dr. John C. Sheehan of the Massachusetts Institute of Technology announced the total synthesis of penicillin from common raw materials, thus solving a problem which had baffled research workers for more than 15 years. Although total synthesis was not commercially practicable, this work, sponsored by Bristol Laboratories, made possible the subsequent synthesis of new penicillins not occurring in nature. Later scientists at Beecham Laboratories in England discovered that a key intermediate (6-aminopenicillanic acid) could be produced by a fermentation process. With these achievements, large scale production of synthetic penicillins became feasible.

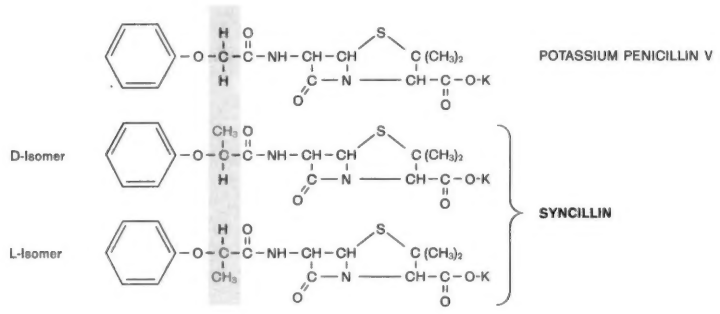
Organic chemists at Bristol then embarked upon an intensive program to develop better penicillins. Over five hundred were synthesized and underwent preliminary screening. Forty-six showed sufficient promise to warrant further investigation. Extensive microbiological, pharmacological, and clinical screening indicated that one compound, SYNCILLIN, had advantages of major importance over other penicillins.

SYNCILLIN is the N-acylation product of 6-aminopenicillanic acid and α-phenoxypropionic acid (the phenylether of lactic acid). It is freely soluble in water and remarkably resistant to decomposition by acid. The acid stability of SYNCILLIN is equivalent to that of penicillin V at pH 2 and pH 3 at 37° C.[1]

SIGNIFICANCE OF MOLECULAR ASYMMETRY AND ISOMERIC COMPLEMENTARITY

SYNCILLIN has a molecular configuration similar to penicillin V, but contains an additional CH_3 group so positioned as to render the adjacent carbon atom asymmetric. (In the formulae below, the added CH_3 group is shown in blue and the asymmetric carbon atom in red.) As a result, SYNCILLIN occurs as a mixture of two isomers.

Each isomer has been synthesized in essentially pure form and found to possess distinctive chemical and biological properties. The L-isomer is 2 to 17 times more active than the D-isomer against many of the organisms tested. As produced, SYNCILLIN is a mixture of the L-isomer and the D-isomer. As will be shown later, the antibiotic effect of the clinically available mixture, SYNCILLIN, is greater than either isomer alone against many organisms. This phenomenon is referred to here as *isomeric complementarity*.





SYNCILLIN

major therapeutic advantages accompany molecular asymmetry

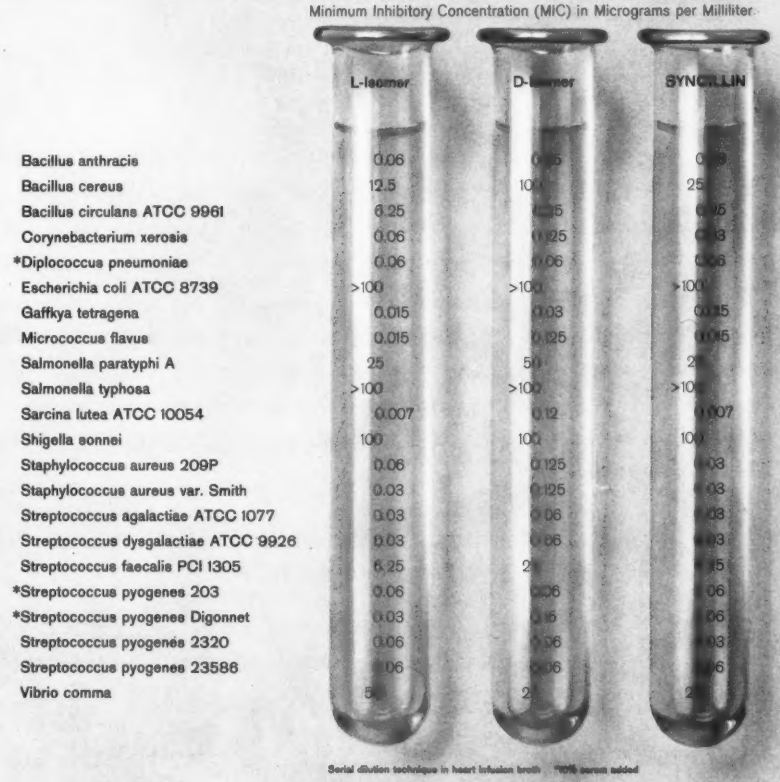
ISOMERIC COMPLEMENTARITY DEMONSTRATED IN VITRO

The *in vitro* minimum inhibitory concentration (MIC) of SYNCILLIN and of each of its two component isomers was determined for a variety of common pathogens and laboratory test organisms. As may be seen from Table 1, all three are highly effective against penicillin-susceptible staphylococci and against pneumococci, streptococci, gonococci, and corynebacteria; all are ineffective against Salmonella, *E. coli,* and other gram-negative coliform bacilli.

SYNCILLIN was more active against many of the test strains including some streptococci and staphylococci than either of its components. This demonstrates *in vitro* the phenomenon of isomeric complementarity.

TABLE 1

Minimum Concentrations of SYNCILLIN and Components Required to Inhibit a Wide Range of Bacteria



Serial dilution technique in heart infusion broth. *10% serum added



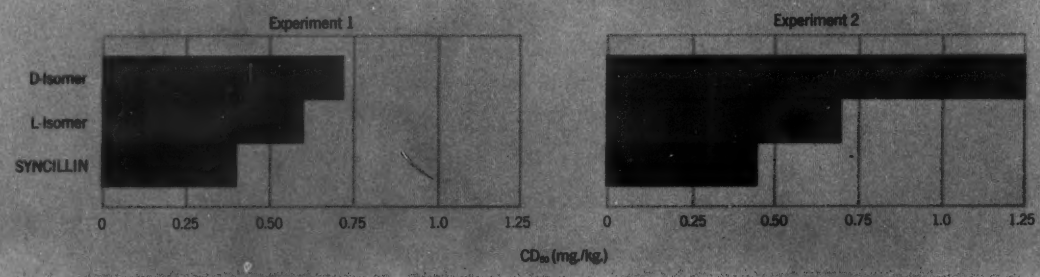
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ISOMERIC COMPLEMENTARITY CONFIRMED IN VIVO

To determine the median curative dose (CD_{50}) mice were infected with 100 times the lethal dose of *Staphylococcus aureus*. Each penicillin being tested was administered intramuscularly at the same time, and the dose required to cure half the animals determined. The greater effect of the mixture of the two isomers (SYNCILLIN) is shown in two independent experiments. (See Figure 1.) Note that isomeric complementarity is thus confirmed *in vivo*.

FIGURE 1 — Median Curative Dose (CD_{50}) for *Staphylococcus aureus* (var. Smith) Infections

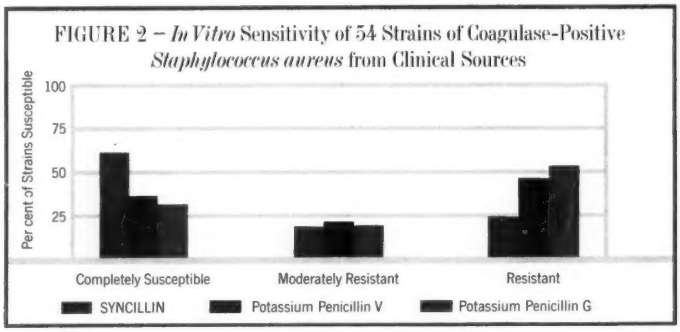


MANY STRAINS OF STAPHYLOCOCCI MORE SENSITIVE TO SYNCILLIN

SYNCILLIN has been tested against a large number of strains of *Staphylococcus aureus* isolated from clinical sources. Many organisms resistant to potassium penicillin G and potassium penicillin V proved sensitive to SYNCILLIN.

Wright[2] performed sensitivity studies on 54 strains, the majority of which were resistant or moderately resistant to penicillin V and penicillin G. Thirty-two (60%) of the strains were sensitive to SYNCILLIN, approximately twice as many as with the other penicillins. (See Figure 2.) In two-thirds of the isolates, SYNCILLIN produced inhibition at concentrations lower than those required for either of the other antibiotics. One strain was more sensitive to penicillin G.

FIGURE 2 – *In Vitro* Sensitivity of 54 Strains of Coagulase-Positive *Staphylococcus aureus* from Clinical Sources

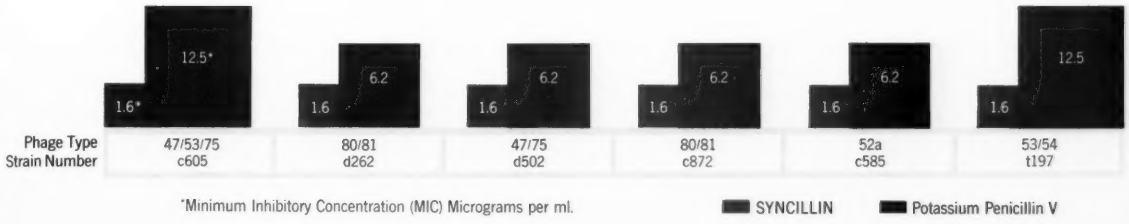


Adapted from Wright[2]

Of equal interest are the findings of White.[3] Six penicillin-resistant strains of staphylococci were isolated from hospital infections. None was sensitive to potassium penicillin V. All were sensitive to SYNCILLIN. (See Figure 3.)

FIGURE 3

Minimum Concentrations of SYNCILLIN Required to Inhibit
Hospital Strains of *Staphylococcus aureus* Resistant to Potassium Penicillin V

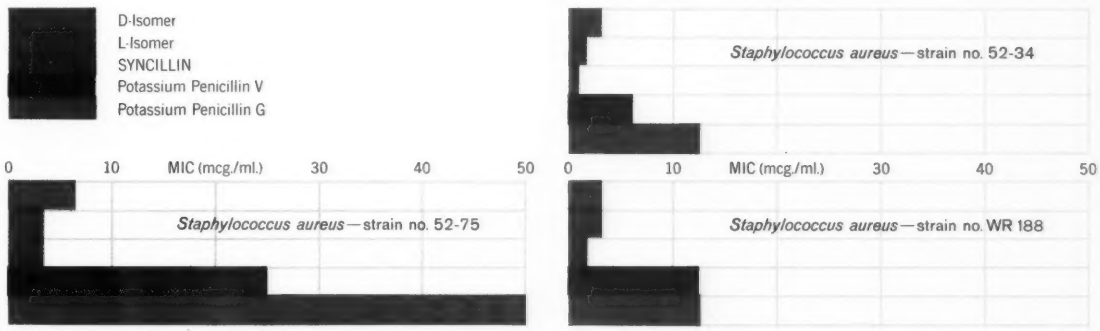


The efficacy of SYNCILLIN against the type 80/81 Staphylococcus (dangerous and widespread in hospitals) is worthy of special attention.

The complementary action of the component isomers is also seen with strains of staphylococci resistant to penicillins. Note that SYNCILLIN is more effective than either isomer against strains 52-34 and WR 188. (See Figure 4.) Against all three strains, SYNCILLIN is effective at concentrations below serum levels, while penicillins V and G are ineffective.

FIGURE 4

Minimum Inhibitory Concentrations (MIC) for Coagulase-Positive
Penicillin-Resistant Strains of *Staphylococcus aureus*



Isomeric complementarity has thus been demonstrated for:

— *certain penicillin-susceptible streptococci, staphylococci and corynebacteria* in vitro *(Table 1)*

— *penicillin-susceptible staphylococci* in vivo *(Figure 1)*

— *penicillin-resistant staphylococci* in vitro *(Figure 4)*



SYNCILLIN

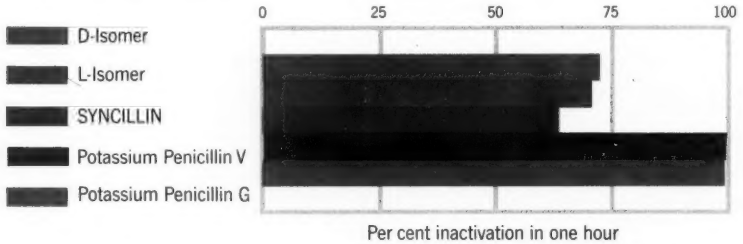
major therapeutic advantages accompany molecular asymmetry

ISOMERIC COMPLEMENTARITY SHOWN BY REDUCED RATE OF INACTIVATION BY PENICILLINASE

Bacterial resistance to penicillin has been attributed to the action of penicillin-inactivating enzymes produced by the invading organisms.[4] As shown in Figure 5, SYNCILLIN is less affected by staphylococcal penicillinase than either of its component isomers – a further demonstration of isomeric complementarity. Further, SYNCILLIN is shown to be less inactivated by this enzyme than penicillin V and penicillin G.

Resistance to SYNCILLIN develops in a slow, step-wise manner characteristic of other penicillins, in contrast to the usually rapid development of resistance to streptomycin.

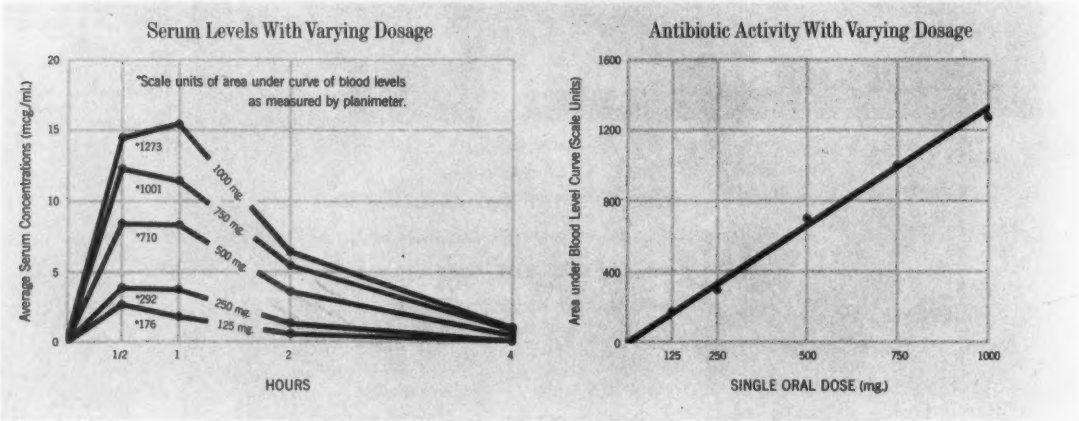
FIGURE 5—Effect of Staphylococcal Penicillinase on Different Penicillins



ANTIBIOTIC ACTIVITY DIRECTLY PROPORTIONAL TO ORAL DOSAGE

Cronk[5] studied blood levels after administering varying amounts of SYNCILLIN. (Figure 6.) Total antibiotic activity (obtained by measuring areas under curves with a planimeter) increases rapidly as the dose is doubled. These data show that increased dosage markedly increases serum concentration and thus may enhance the drug's effectiveness.

FIGURE 6



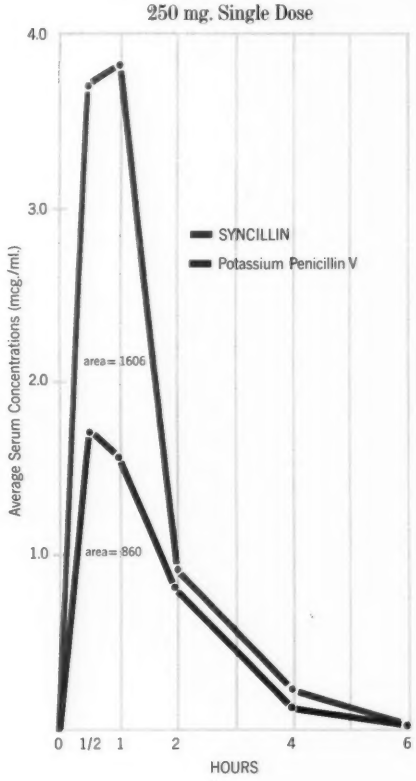
BLOOD LEVELS TWICE AS HIGH AS WITH POTASSIUM PENICILLIN V AFTER ORAL ADMINISTRATION

Wright[6] performed comparative crossover blood level studies on volunteer subjects receiving equivalent amounts of potassium penicillin V and SYNCILLIN. The peak concentrations attained during the first hour after administration were twice as high with SYNCILLIN.

The total antibiotic activity as measured by the area under the curves (see Figure 7) indicates an almost 2 to 1 superiority of SYNCILLIN (1606) over potassium penicillin V (860).

The higher blood levels may be of value with organisms of only moderate penicillin-sensitivity where doubling the blood concentration may be essential for effective bactericidal action. In addition these higher levels may be necessary where there is infection in areas with a poor blood supply.[7] Under these circumstances a higher blood concentration may provide the increased diffusion pressure required to deliver adequate amounts to the tissue.

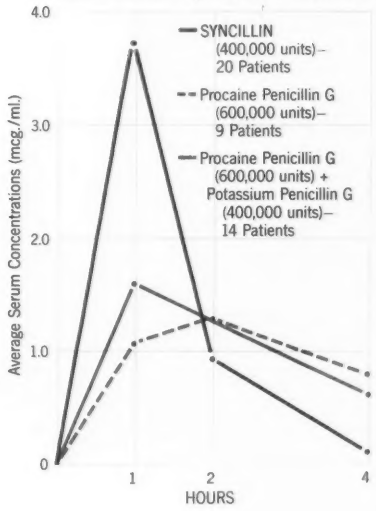
FIGURE 7
20 Subject Crossover
250 mg. Single Dose



BLOOD LEVELS MUCH HIGHER THAN WITH INTRAMUSCULAR PENICILLIN G

In addition, blood levels attained with oral SYNCILLIN[6] are much higher than those with intramuscular penicillin G.[8a, b] (See Figure 8.) Note that the level at one hour for SYNCILLIN (3.8 mcg./ml.) is more than twice as high as with procaine penicillin G, even when reinforced with potassium penicillin G (1.6 mcg./ml.). Since penicillins are *bactericidal,* these intermittent high serum levels can be clinically significant. Thus, SYNCILLIN offers the promise of superior efficacy via the safer oral route.

FIGURE 8—Serum Levels after Oral Administration of SYNCILLIN (250 mg.) and after Intramuscular Injection of Penicillin G





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REDUCED HAZARD OF SERIOUS ALLERGENICITY BY SAFER ORAL ROUTE

SYNCILLIN has been administered in multiple doses to 437 patients and volunteers. One patient developed itching during therapy, possibly an allergic side effect. Another had a purpuric rash, but no relationship to SYNCILLIN was established. No reactions were observed in 9 patients with a known history of sensitivity to penicillin.

While the above data suggests the possibility of reduced allergenic hazard, no definite conclusions may be drawn at this time. *The usual precautions for oral penicillin therapy should be observed.* Patients with histories of asthma, hay fever, urticaria, or previous penicillin-sensitivity should especially be watched carefully. Since SYNCILLIN is administered orally, it may be expected to be safer than parenteral penicillin.

As Flippin[9] recently stated, "... it is well established that serious allergy to the drug [penicillin] is most likely to occur following parenteral administration, especially after repeated intramuscular injections; the oral route is least likely to initiate severe hypersensitivity reactions. This can be explained partly by the fact that when reactions develop following oral medication, they are usually slow enough to treat symptomatically; thus the progression of the reaction can usually be interrupted. . . . In view of the relatively high incidence of severe allergy to injectable penicillin, it would seem advisable to employ oral penicillin routinely, except in the control of infections involving the blood stream, endocardium, meninges, etc., in which cases the parenteral route remains the preferred treatment."

SYNCILLIN, like other penicillins, is essentially free of other toxicity. No hematopoietic, hepatic, or renal toxicity was observed in 210 volunteers receiving 1 gm. daily for 2 to 3 weeks.[10]

CLINICAL EFFICACY DEMONSTRATED IN PENICILLIN-SENSITIVE INFECTIONS

Clinical trials conducted by Blau and Kanof,[11] White,[12] Prigot,[13] Robinson,[14] Dube,[15] Ferguson,[16] Rutenburg,[17] Richardson,[18] Bunn,[19] Cronk,[5] Kligman,[10] and Yow [20] demonstrated the efficacy of SYNCILLIN in a variety of streptococcal, staphylococcal, pneumococcal, and gonococcal infections. Conditions treated included respiratory, skin, soft tissue, wound, and chronic urinary tract infections; acute gonorrhea; cellulitis; septicemia; otitis media; gingivitis; and Vincent's angina. In a few patients SYNCILLIN was used for rheumatic fever or gonorrheal prophylaxis.

One hundred seventy-two of one hundred ninety-six patients responded favorably to SYNCILLIN. The failures included 1 patient with pustular dermatoses, 10 elderly patients with chronic urinary tract infections, 1 patient with gonorrhea, 1 patient with a gram-negative infection, and 10 patients with staphylococcal infections. Lack of response of staphylococcal infections was attributed to the presence of resistant organisms or local suppurative foci requiring drainage.



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Relatively few side effects were encountered. One patient experienced moderate itching of the skin which was controlled by an antihistamine. Another reported pruritus ani which did not interfere with therapy. Diarrhea occurred in 4 instances. There was one purpuric rash, but no relationship to SYNCILLIN could be established.

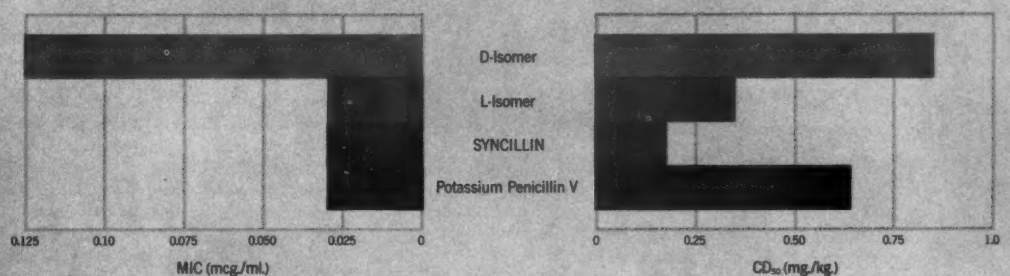
Clinical response usually begins within 24 hours in infections susceptible to SYNCILLIN. Recovery occurs in 4 to 7 days depending upon the severity of the infection. Gonorrheal infections respond very promptly to SYNCILLIN; 500 mg. b.i.d. for two days usually produce bacteriologic cures.

IMPROVED ANTIBIOTIC EFFECT FROM COMPLEMENTARY ACTION OF ISOMERS

SYNCILLIN is a mixture of isomers. The L-isomer is 2 to 17 times more active than the D-isomer against many of the organisms tested. Furthermore, the D- and L-isomers have other distinguishing chemical, pharmacological, and microbiological properties. Their *in vivo* and *in vitro* activities differ for many important pathogens. *Against many of the organisms tested, the combination of isomers* (SYNCILLIN) *is much more active than the stronger isomer alone.* This phenomenon of isomeric complementarity is not always demonstrable, for in a few instances SYNCILLIN is slightly less active.

Isomeric complementarity has previously been demonstrated *in vitro* (Figure 4) and *in vivo* (Figure 1). Figure 9 reveals a third form of superiority related to isomeric complementarity. Equal concentrations of SYNCILLIN and penicillin V were required to inhibit this growth of staphylococci *in vitro*. But, *in vivo*, a much smaller amount of SYNCILLIN *(one-third that of penicillin V)* was effective in an experimental infection with the same strain. These observations on complementary action indicated the advantage of producing the mixture of isomers as the medication to be made available for clinical therapy.

FIGURE 9 — Comparison of CD_{50} and MIC Values Against *Staphylococcus aureus* (var. Smith)



Isomeric complementarity has thus been demonstrated for:

— *certain penicillin-susceptible streptococci, staphylococci and corynebacteria* in vitro *(Table 1)*

— *penicillin-susceptible staphylococci* in vivo *(Figures 1 and 9)*

— *penicillin-resistant staphylococci* in vitro *(Figure 4)*

— *staphylococcal penicillinase antibiotic inactivation (Figure 5)*



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Indications:

SYNCILLIN is recommended in the treatment of infections caused by pneumococci, streptococci, gonococci, corynebacteria, and penicillin-sensitive staphylococci. In addition, SYNCILLIN is effective against certain strains of staphylococci resistant to other penicillins.

SYNCILLIN, like other oral penicillins, is not recommended at the present time in deep-seated or chronic infections, subacute bacterial endocarditis, meningitis, or syphilis.

Dosage:

125 mg. or 250 mg. three times daily, depending on the severity of infection. Larger doses (e.g., 500 mg. t.i.d.) may be used for more severe infections. SYNCILLIN may be administered without regard to meals.

Beta hemolytic streptococcal infections should be treated with SYNCILLIN for at least ten days.

Precautions:

While present data suggest the possibility of reduced allergenic hazard, no definite conclusions may be drawn at this time. *Therefore the usual precautions with oral penicillin therapy must be observed.* Patients with histories of asthma, hay fever, urticaria, or previous reactions to penicillin should be watched with special care.

Diarrhea has been reported occasionally following heavy dosage. If this occurs, the interval between dosages should be lengthened.

If superinfection occurs during therapy, appropriate measures should be taken.

Since some strains of staphylococci are resistant to SYNCILLIN as well as to other penicillins, cultures and sensitivity tests should be performed where indicated by clinical judgment. As is true with all antibiotics, clinical response does not always correlate with laboratory bacterial sensitivity reports.

Supply:

125 and 250 mg. tablets, bottles of 25 and 100. 125 mg. powder for oral solution, 60 ml. vials.

References: 1. Lein, J.: Microbiology report to Bristol Laboratories Inc. 2. Wright, W. W.: Microbiology report to Bristol Laboratories Inc. 3. White, A. C.: Microbiology report to Bristol Laboratories Inc. 4. Dubos, R. J.: Bacterial and Mycotic Infections of Man, 3rd edition, Philadelphia, J. B. Lippincott Co., p. 690. 5. Cronk, G. A.: Clinical report to Bristol Laboratories Inc. 6. Wright, W. W.: Clinical report to Bristol Laboratories Inc. 7. Kass, E. H.: Am. J. Med. *18*:764 (May) 1955. 8a. White, A. C.; Couch, R. A.; Foster, F.; Calloway, J.; Hunter, W., and Knight, V.: in Welch, H. and Marti-Ibañez, F.: Antibiotics Annual — 1955-1956, Medical Encyclopedia, Inc., New York, 1956, p. 490. b. Data on file — at Bristol Laboratories. 9. Flippin, H. F.: Pennsylvania M. J. *62*:864 (June) 1959. 10. Kligman, A.: Clinical report to Bristol Laboratories Inc. 11. Blau, S., and Kanof, N.: Clinical report to Bristol Laboratories Inc. 12. White, A. C.: Clinical report to Bristol Laboratories Inc. 13. Prigot, A.: Clinical report to Bristol Laboratories Inc. 14. Robinson, C.: Clinical report to Bristol Laboratories Inc. 15. Dube, A. H.: Clinical report to Bristol Laboratories Inc. 16. Ferguson, B.: Clinical report to Bristol Laboratories Inc. 17. Rutenburg, A. M.: Clinical report to Bristol Laboratories Inc. 18. Richardson, J. H.: Clinical report to Bristol Laboratories Inc. 19. Bunn, P. A.: Clinical report to Bristol Laboratories Inc. 20. Yow, E. M.: Clinical report to Bristol Laboratories Inc.

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Caffeine ..... gr. ½
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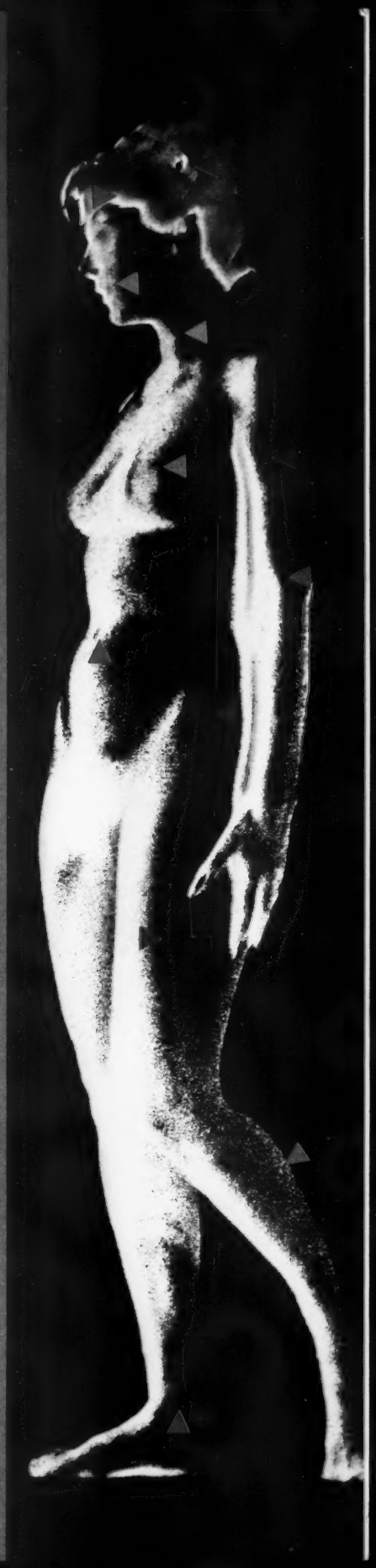
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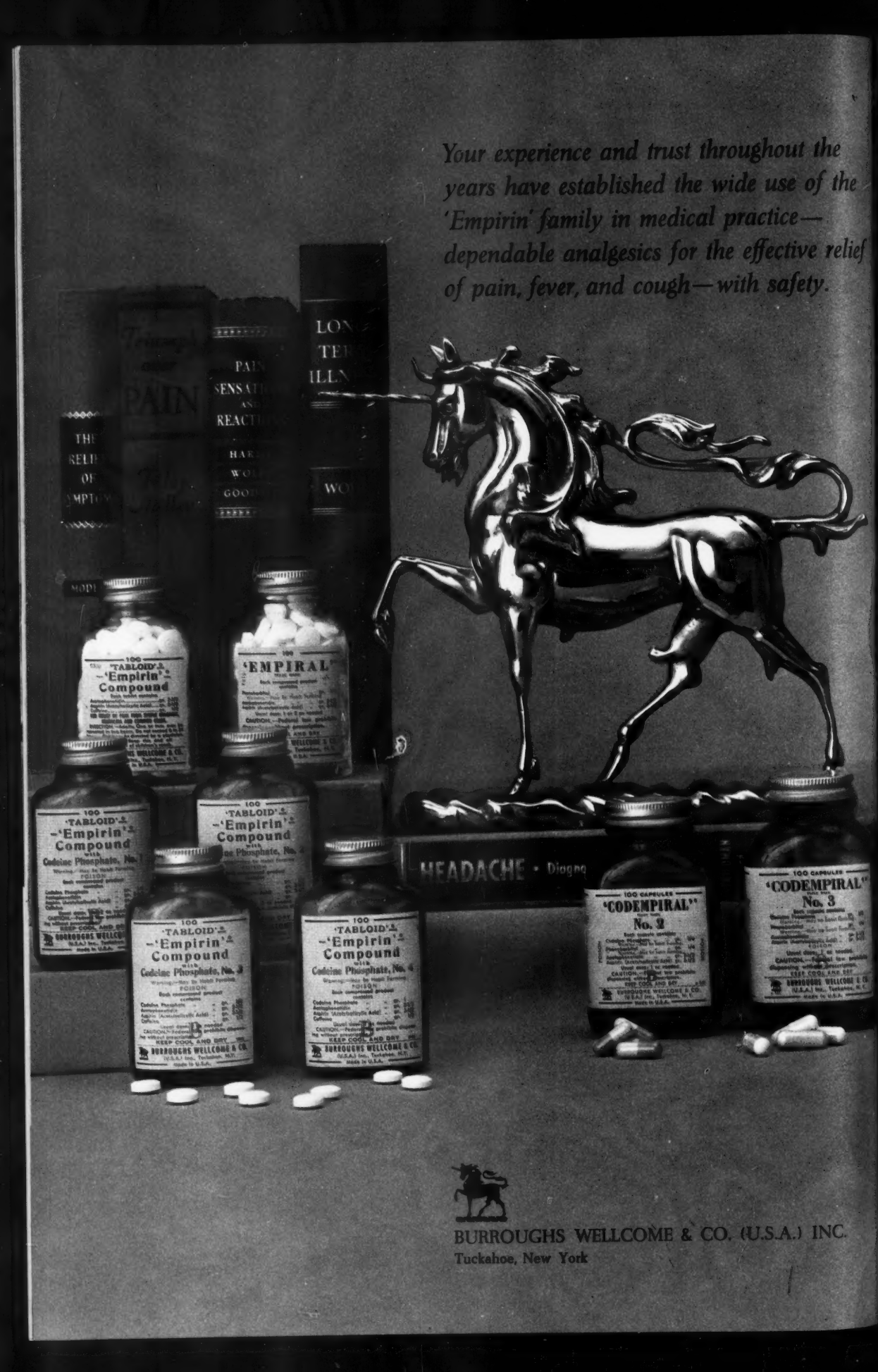
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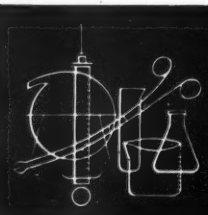
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EQUIPMENT AND SUPPLIES FOR THE MEDICAL PROFESSION SINCE 1919

Counteract Depression with
distinctively WELL-TOLERATED

Deaner®

deanol acetamidobenzoate

- 'Deaner' may be prescribed with little or no concern over side effects even in the presence of liver disease, diabetes, cardiovascular disease, and a long list of other chronic conditions, except grand mal epilepsy (only contraindication).
- 'Deaner' *is not a monoamine oxidase inhibitor;* hence it is not necessary to monitor its administration with repeated, expensive laboratory tests.
- This notable freedom from side effects endows Deaner's long-term administration with easier patient supervision, better patient cooperation, and greater safety.
- Dosage is simple—initially, 50 mg. (2 tablets) daily in the morning. *Gradually, apathy and defeat are transformed into affability and renewed interest and vigor.*

Write for details and the applicability of 'Deaner' in behavior problems of children

Riker Northridge, California



The menopausal patient in need of psychic support . . . the postpartum patient suffering the "baby blues" . . . the convalescent patient worried about her future health . . . these and many other patients will often benefit from the antidepressant, mood-lifting effect of

Dexamyl® Tablets • Elixir
Spansule® brand of sustained release capsules

brand of dextro amphetamine plus amobarbital

When the depressed patient is particularly listless and lethargic, she will often benefit from the gentle stimulating effect of

Dexedrine® Tablets • Elixir • Spansule® capsules
brand of dextro amphetamine

Smith Kline & French Laboratories

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